harman/kardon Service Manual

AVR137/230

5 x 30W 5.1 CHANNEL A/V RECEIVER

CONTENTS

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ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor "chip" components.

The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge build-up or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical change sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   CAUTION : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together or your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES devices.

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing.

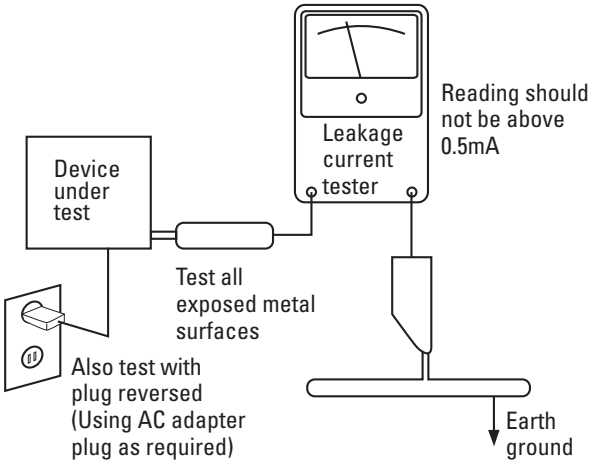
Components identified with the IEC symbol ⚠ in the parts list are special significance to safety. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings or resistance, wattage, or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before retuming the product to the customer.

SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed o.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

Audio Section

Stereo Mode
Continuous Average Power (FTC)

40 Watts per channel, 20Hz–20kHz,
@ < 0.07% THD, both channels driven into 8 ohms

Five-Channel Surround Modes
Power Per Individual Channel

Front L&R channels:
30 Watts per channel,
@ < 0.07% THD, 20Hz–20kHz into 8 ohms

Center channel:
30 Watts, @ < 0.07% THD, 20Hz–20kHz into 8 ohms

Surround channels:
30 Watts per channel,
@ < 0.07% THD, 20Hz–20kHz into 8 ohms

Input Sensitivity/Impedance	
Linear (High Level)	200mV/47kohms
Signal-to-Noise Ratio (IHF-A)	95dB
Surround System Adjacent Channel Separation	
Analog Decoding (Pro Logic, etc.)	40dB
Dolby Digital (AC-3)	55dB
DTS	55dB
Frequency Response	
@ 1W (+0dB, –3dB)	10Hz–100kHz
High Instantaneous Current Capability (HCC)	±25 Amps
Transient Intermodulation Distortion (TIM)	Unmeasurable
Rise Time	16 µsec
Slew Rate	40V/µsec

FM Tuner Section

Frequency Range	87.5–108MHz
Usable Sensitivity	IHF 1.3 µV/13.2dBf
Signal-to-Noise Ratio	Mono/Stereo: 70/65dB (DIN)
Distortion	Mono/Stereo: 0.15/0.3%
Stereo Separation	35dB @ 1kHz
Selectivity	±400kHz: 70dB
Image Rejection	80dB
IF Rejection	90dB

AM Tuner Section

Frequency Range	522–1620kHz
Signal-to-Noise Ratio	45dB
Usable Sensitivity	Loop: 500µV
Distortion	1kHz, 50% Mod: 0.8%
Selectivity	±10kHz: 30dB

Video Section

Video Format	PAL/NTSC
Input Level/Impedance	1Vp-p/75 ohms
Output Level/Impedance	1Vp-p/75 ohms
Video Frequency Response	10Hz–8MHz (–3dB)

General

Power Requirement	AC 220-240V/50Hz
Power Consumption	72W idle, 580W maximum (2 channels driven)
Dimensions (Max)	
Width	440mm
Height	165mm
Depth	382mm
Weight	9.6 kg

Depth measurement includes knobs, buttons and terminal connections.
Height measurement includes feet and chassis.
All features and specifications are subject to change without notice.

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Logic 7 is a registered trademark of Lexicon, Inc.

SYMPTOM	CAUSE	SOLUTION
Unit does not function when **Main Power Switch** 1 is pushed	• No AC Power	• Make certain AC power cord is plugged into a live outlet • Check to see if outlet is switch controlled
Display lights, but no sound or picture	• Intermittent input connections • **Mute** is on • Volume control is down	• Make certain that all input and speaker connections are secure • Press **Mute** button 34 • Turn up volume control
Sound is heard, but Front-Panel Display does not light	• Display brightness is turned off	• Follow the instructions in the Display Brightness section on page 27 so that the display is set to VFD FULL
No sound from any speaker; light around **Power switch** 2 is red	• Amplifier is in protection mode due to possible short • Amplifier is in protection mode due to internal problems	• Check speaker-wire connections for shorts at receiver and speaker ends • Contact your local Harman Kardon service depot
No sound from surround or center speakers	• Incorrect surround mode • Incorrect configuration • Stereo or Mono program material • Speakers not properly connected	• Select a mode other than Stereo • Check speaker mode • With (analog or digital) Dolby surround modes, the surround decoder may not create rear-channel information from non-encoded programs • Check speaker-wire connections or use test tone to verify connections (see page 20)
Unit does not respond to remote commands	• Weak batteries in remote • Wrong device selected • **Remote sensor** 15 is obscured	• Change remote batteries • Press the **AVR selector** 6 • Make certain front-panel sensor is visible to remote or connect remote sensor
Intermittent buzzing in tuner	• Local interference	• Move unit or antenna away from computers, fluorescent lights, motors or other electrical appliances
Letters flash in the **Channel Indicator Display** 30 and Digital Audio stops	• Digital audio feed paused	• Resume play for DVD • Check that Digital Signal is fed to the Digital Input selected

Processor Reset

In the rare case where the unit's operation or the displays seem abnormal, the cause may involve the erratic operation of the system's memory or microprocessor.

To correct this problem, first unplug the unit from the AC wall outlet and wait at least three minutes. After the pause, reconnect the AC power cord and check the unit's operation. If the system still malfunctions, a system reset may clear the problem.

To clear the AVR's entire system memory including tuner presets, output level settings, delay times and speaker configuration data, first put the unit in Standby by pressing the **System Power Control** button 2. Next, press and hold the Surround Mode Button 7 for 5 seconds.

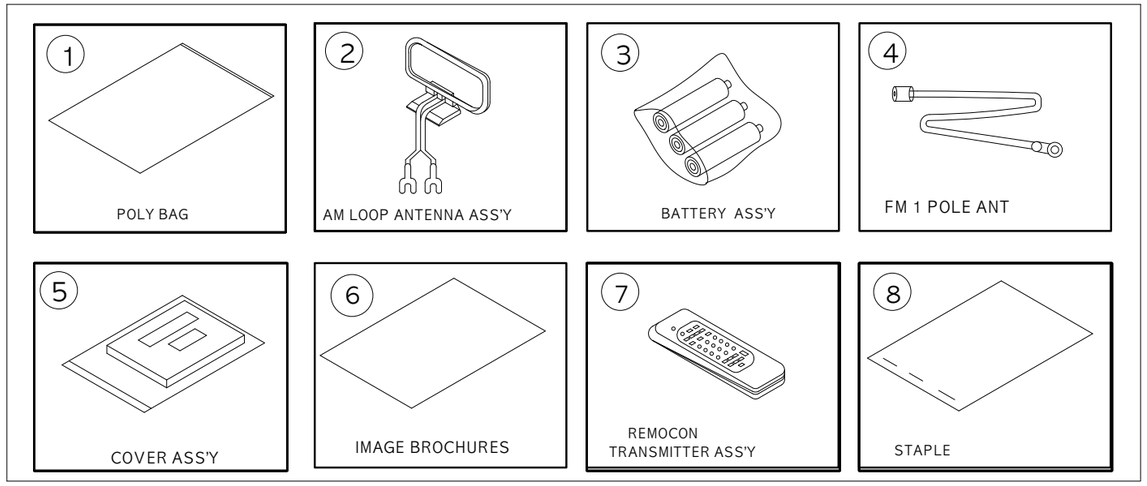
The unit will turn on automatically. Note that once you have cleared the memory in this manner, it is necessary to re-establish all system configuration settings and tuner presets.

NOTE: Resetting the processor will erase any configuration settings you have made for speakers, output levels, surround modes, digital input assignments as well as the tuner presets. After a reset the unit will be returned to the factory presets, and all settings for these items must be reentered.

If the system is still operating incorrectly, there may have been an electronic discharge or severe AC line interference that has corrupted the memory or microprocessor.

If these steps do not solve the problem, consult an authorized Harman Kardon service depot.

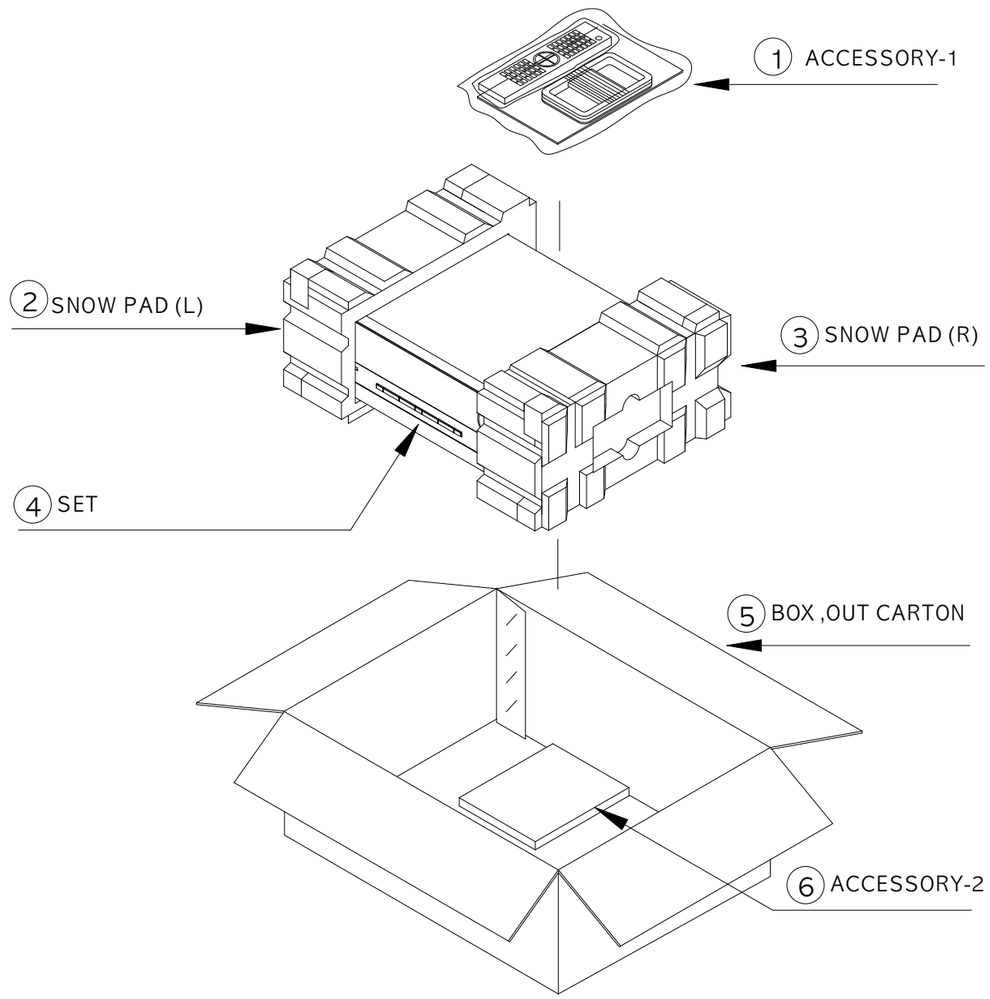
1. Instruction manual ass'y - Accessories



ACCESSORY-1				
NO		DESCRIPTION	PARTS NO.	Q,ty
1		POLY BAG	CPB1061Y	1
2		AM LOOP ANTENNA ASS'Y	CSA1A027Z	1
3		BATTERY	CABR03P3	3
4		FM 1 POL ANT(UL)	CSA1A018Z	1
5		COVER ASS'Y	CGRAVR130/230ZA	1
	1	COVER A	CGR1A331M7H43	1
	2	COVER B	CGR1A332M7H43	1
	3	SHEET,FRONT COVER	CQE1A220Z	1
	4	PAD , COVER	CPS1A676	1
	5	BAG , POLY	CPB1A176Z	1
6		IMAGE BROCHURES	HQE1A273Z	1
7		REMOCON ASS'Y	CARTAVR132/230	1
8		STAPLE	CPL0905	3

ACCESSORY-2			
NO	DESCRIPTION	PARTS NO.	Q,ty
9	POLY BAG	CPB1061Y	1
10	BOOKLET,INFORMATION	CQE1A180Z	1
11	MANUAL,INSTRUCTION	CQX1A1154X	1
12	MANUAL ,SETUP GUIDE	CQX1A1138Y	1
13	STAPLE	CPL0905	3

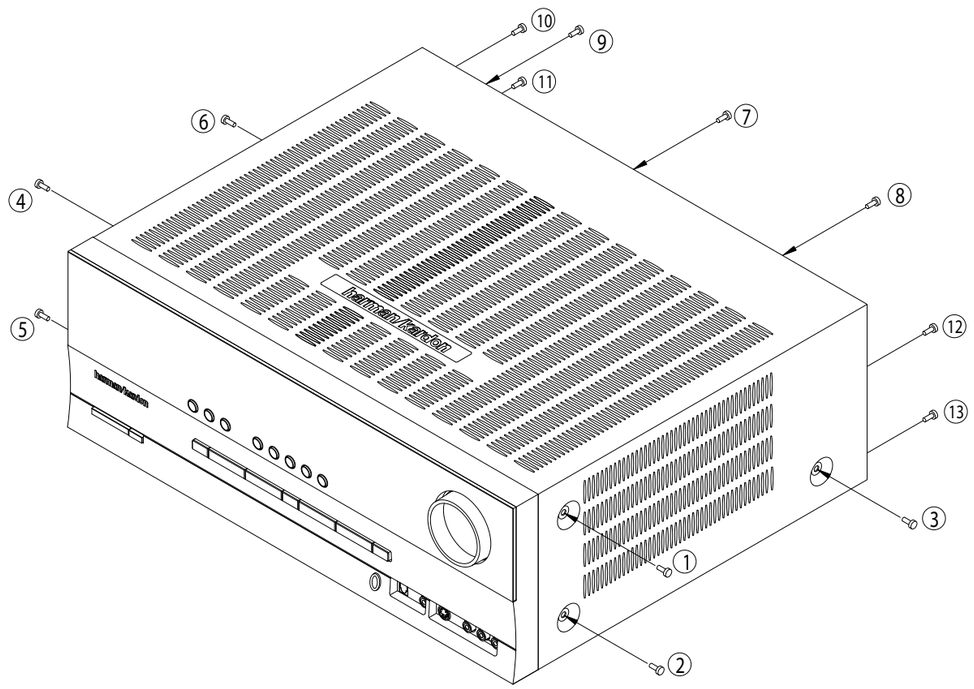
2. Package Drawing



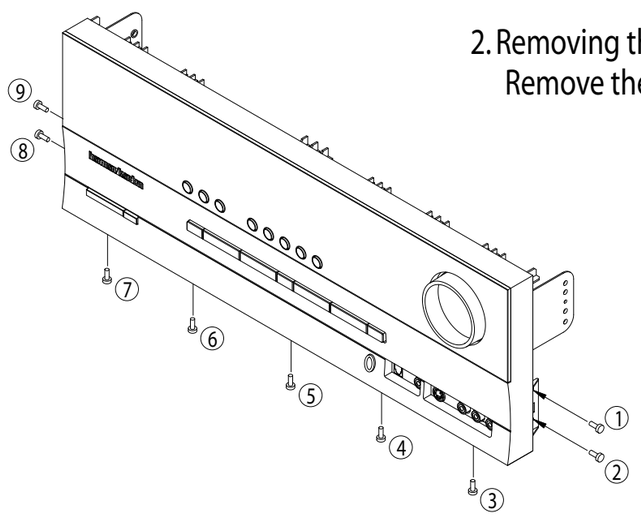
NO	DESCRIPTION	PARTS NO.	Q,ty
1	ACCESSORY-1	CQXAVR132/230	1
2	SNOW,PAD(L)	CPS4A564	1
3	SNOW,PAD(R)	CPS4A565	1
4	SET	AVR132/230SET	1
5	BOX,OUT CARTON	CPG1A820T	1
6	ACCESSORY-2	CQXAVR132/230	1

DISASSEMBLY

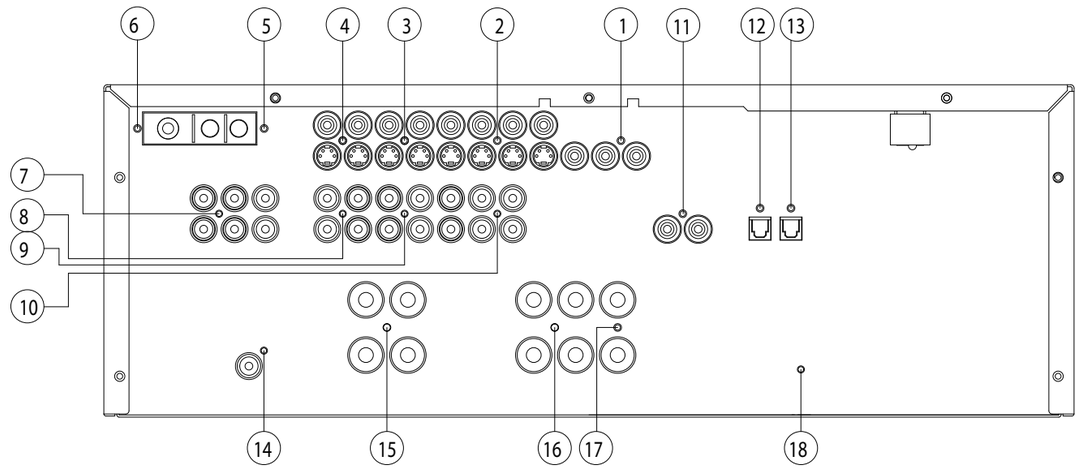
1. Removing the Top Cabinet
Remove the Screws ① ~ ⑬



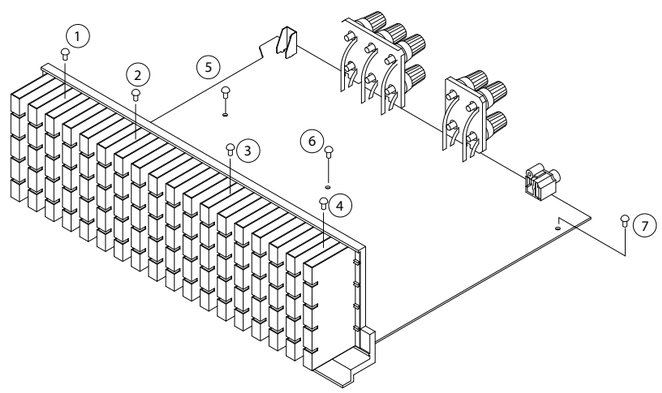
2. Removing the Front Panel
Remove the Screws ① ~ ⑨



3. Removing the Rear Panel
Remove the Screws ① ~ ⑱



4. Removing the Main PCB
Remove the Screws ① ~ ⑦



DISASSEMBLY PROCEDURES for HK AVR 137

<1> TOP-CABINET(21) REMOVAL

1. Remove 13 screws(S1,S7) and then remove the Top-cabinet.

<2> FRONT PANEL ASS'Y REMOVAL

1. Remove the Top-cabinet, referring to the previous step<1>.
2. Disconnect the card cable between connector(CN72-17p) on the Fip PCB(37-1) and connector(CN72) on the Input PCB(39-1).
3. Disconnect the lead wire(BN81-8P) on the Fip PCB(37-1) from connector(CN81) on the Trans PCB(40-4).
4. Disconnect the lead wire(BN22-6P) on the Phone PCB(37-5) from connector(CN22) on the Input PCB(39-1).
5. Disconnect the lead wire(BN18-5P) on the Phone PCB(37-5) from connector(CN18) on the Input PCB(39-1)
6. Disconnect the lead wire(BN10-4P) on the Volume PCB(37-6) from connector(CN10) on the Input PCB(39-1)
7. Disconnect the lead wire(BN41-6P) on the Volume PCB(37-6) from connector(CN41) on the Video PCB(41)
8. Remove 1 screw(S10) and then lead wire(JW82-1P,JW83-1P) on the Phone PCB(37-5).
9 .Remove 1screw(S10) and then lead wire(JW84-1P) on the Volume PCB(37-3).
10. Remove 10 screws(S1) and then remove the Front Panel ASS'Y.

<3> Volume PCB(37-6) REMOVAL

1. Remove the Top-cabinet, referring to the previous step<1>.
2. Remove the Front Panel ASS'Y, referring to the previous step<2>.
3. Pull out the Volume Knob ASS'Y.
4. Disconnect connector(CN84) on the Volume PCB(37-6) from the lead wire(BN84-5P) on the Fip PCB(37-1).
5. Remove 8 screws(S2,S14), and then remove the Volume PCB(37-6).

<4>PHONE PCB(37-5) REMOVAL

1. Remove the Top-cabinet, referring to the previous step<1>.
2. Remove the Front Panel ASS'Y, referring to the previous step<2>.
3.. Disconnect connector(CN85)on the Phone PCB(37-5) from the lead wire(BN85-2P) on the Fip PCB(37-1).
4. Remove 2 screws(S2) and then remove the Phone PCB(37-5).

.

<5>POWER LED PCB(37-3) REMOVAL

1. Remove the Top-cabinet, referring to the previous step<1>.
2. Remove the Front Panel ASS'Y, referring to the previous step<2>.
3. Disconnect connector(CN88) on the Power Led PCB(37-3) from the lead wire(BN88-4P) on the Fip PCB(37-1) .
4. Remove 2 screws(S2) and then remove the Power led PCB(37-3).

<6>FIP PCB(37-1) REMOVAL

1. Remove the Top-cabinet, referring to the previous step<1>.
2. Remove the Front Panel ASS'Y, referring to the previous step<2>.
3. Disconnect the lead wire(BN84-5P) on the Fip PCB(37-1) from connector(CN84) on the Volume PCB(37-6).
4. Disconnect the lead wire(BN85-2P) on the Fip PCB(37-1) from connector(CN85) on the Phone PCB(37-5).
5. Disconnect the lead wire(BN88-4P) on the Fip PCB(37-1) from connector(CN88) on the Power Led PCB(37-3).
6. Remove 3 screws(S2) and then remove the Guide PCB(37-8) & the Fip PCB(37-1).

<7>TUNER MODULE(42) REMOVAL

1. Remove the Top-cabinet, referring to the previous step<1>.
2. Disconnect the card cable between connector(CON1-13p) on the Tuner module(42) and connector(CN13) on the Input PCB(39-1).

3. Remove 2 screws(S8) and then remove the Tuner Module(42).

<8>VIDEO PCB(41) REMOVAL

1. Remove the Top-cabinet, referring to the previous step<1>.
2. Disconnect the card cable between connector(BN14-13p) on the Video PCB(41)
   and connector(CN14) on the Input PCB(39-1).
3. Disconnect connector(CN43) on the Video PCB(41)
   from the lead wire(BN43-4P) on the Regulator PCB(A)(40-2).
4. Disconnect connector(CN41) on the Video PCB(41) from the lead wire(BN41-6P) on the Volume PCB(37-6).
5. Remove 6 screws(S8) and then remove the Video PCB(41).

<9>INPUT PCB(39-1) REMOVAL

1. Remove the Top-cabinet, referring to the previous step<1>.
2. Remove the Tuner module(42), referring to the previous step<7>
3. Remove the Video PCB(41), referring to the previous step<8>
4. Disconnect connector(CN20) on the the Input PCB(39-1)
   from the lead wire(BN20-5P) on the Regulator PCB(B)(40-5).
5. Disconnect connector(CN22) on the Input PCB(39-1) from the lead wire(BN22-6P) on the Phone PCB(37-5).
6. Disconnect connector(CN18) on the Input PCB(39-1) from the lead wire(BN18-5P) on the Phone PCB(37-5)
7. Disconnect connector(CN10) on the Input PCB(39-1) from the lead wire(BN10-4P) on the Volume PCB(37-6).
8. Disconnect the card cable between connector(CN14) on the Input PCB(39-1).
   and connector(BN14-9p) on the Video PCB(41).
9. Disconnect the card cable between connector(CN12-21p) on the Input PCB(39-1)
   and connector(CN12-21p)) on the main PCB(38-1)
10. Disconnect the card cable between connector(CN11-13p) on the Input PCB(39-1)
    and connector(CN11-13p) on the main PCB(38-1)
11. Disconnect connector(CN49) on the Input PCB(39-1) from the lead wire(BN49-5P) on the Rds PCB(39-2).
12. Remove 11 screws(S8,S15) and then remove the Input PCB(39-1).

<10>POWER TRANS(36) & POWER PCB ASS'Y(40) REMOVAL

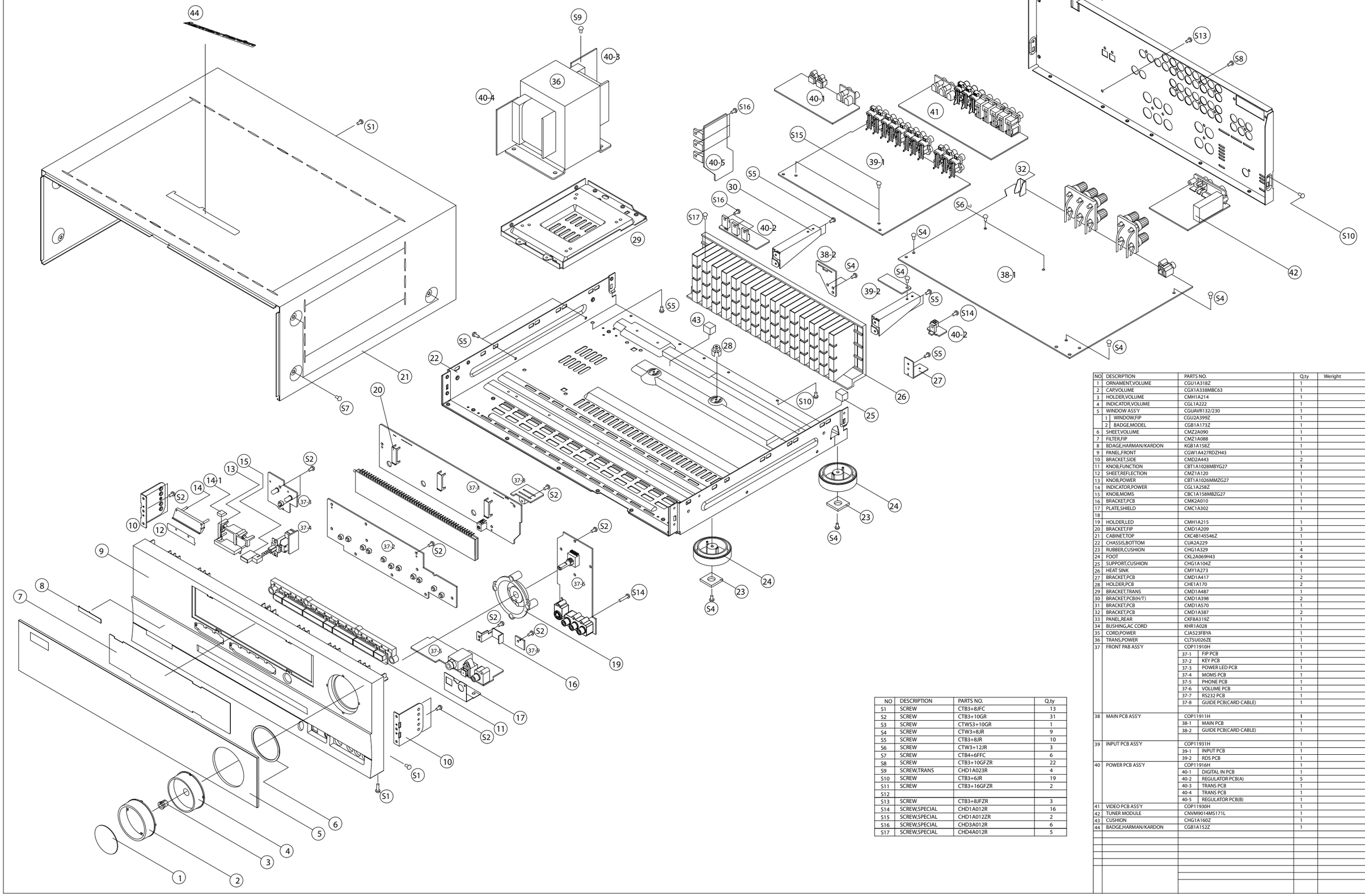
1. Remove the Top-cabinet, referring to the previous step<1>.
2. Disconnect lead wire of the Power Trans(36) from connector (CN91-3P) on the Main PCB(38-1)
3. Disconnect connector(CN19-3P,CN20-4P) on TRANS PCB(40-3)
   from the lead wire(BN19-3P,BN20-4P) on the Main PCB(38-1).
4. Disconnect the lead wire(BN96-8P) on the Power PCB(40-4)
   from connector(CN96) on the Regulator PCB(B)(40-5).
5. Disconnect the lead wire(BN99-8P) on the Power PCB(40-4)
   from connector(CN99) on the Regulator PCB(A)(40-2).
6. Disconnect connector(CN81) on the Trans PCB(40-4) from the lead wire(BN81-8P) on the Fip PCB(37-1).
7. Remove 4 Trans screws(S9) and then remove the Power Trans(36)& Power PCB ASS'Y(40) REMOVAL .

<11>MAIN PCB ASS'Y(38-1) REMOVAL

1. Remove the Top-cabinet, referring to the previous step<1>.
2. Remove the Tuner module(42), referring to the previous step<7>.
3. Remove the Video PCB(41) referring to the previous step<8>.
5. Remove the Input PCB(39-1), referring to the previous step<9>.
6. Remove the AC Cord(35) on the Main PCB(38-1)
7. Disconnect the lead wire(BN90-2P) on the Main PCB(38-1) from connector(CN86) on Moms PCB(37-4).

8. Disconnect connector (CN91-3P) on the Main PCB(38-1) from lead wire of the Power Trans(36)
9. Disconnect the lead wire(BN89-2P) on the Main PCB(38-1) from connector(CN89) on Regulator PCB(A)(40-2).
10. Disconnect the lead wire(BN19-3P,BN20-4P) on the Main PCB(38-1)
from connector(CN19-3P,CN20-4P) on TRANS PCB(40-4).
11. Remove 11screws(S13-1EA, S4-2EA, S6-2EA, S8-6EA) and then remove the Main PCB ASS'Y(38-1).

AVR 137/230 EXPLODED VIEW



NO	DESCRIPTION	PARTS NO.	Q.ty
S1	SCREW	CTB3+8JFC	13
S2	SCREW	CTB3+10GR	31
S3	SCREW	CTWS3+10GR	1
S4	SCREW	CTW3+8JR	9
S5	SCREW	CTB3+8JR	10
S6	SCREW	CTW3+12JR	3
S7	SCREW	CTB4+6FFC	6
S8	SCREW	CTB3+10GFZR	22
S9	SCREW,TRANS	CHD1A023R	4
S10	SCREW	CTB3+6JR	19
S11	SCREW	CTB3+16GFZR	2
S12			
S13	SCREW	CTB3+8JFZR	3
S14	SCREW,SPECIAL	CHD1A012R	16
S15	SCREW,SPECIAL	CHD1A012ZR	2
S16	SCREW,SPECIAL	CHD3A012R	6
S17	SCREW,SPECIAL	CHD4A012R	5

NO	DESCRIPTION	PARTS NO.	Q.ty	Weright
1	ORNAMENT,VOLUME	CGU1A318Z	1	
2	CAP,VOLUME	CGX1A338MBC63	1	
3	HOLDER,VOLUME	CMH1A214	1	
4	INDICATOR,VOLUME	CGL1A222	1	
5	WINDOW ASS'Y	CGUAVR132/230	1	
	1 WINDOW,FIP	CGU2A399Z	1	
	2 BADGE,MODEL	CGB1A173Z	1	
6	SHEET,VOLUME	CMZ2A090	1	
7	FILTER,FIP	CMZ1A088	1	
8	BDAGE,HARMAN/KARDON	KGB1A158Z	1	
9	PANEL,FRONT	CGW1A427RDZH43	1	
10	BRACKET,SIDE	CMD2A443	2	
11	KNOB,FUNCTION	CBT1A1028MBYG27	1	
12	SHEET,REFLECTION	CMZ1A120	1	
13	KNOB,POWER	CBT1A1026MMZG27	1	
14	INDICATOR,POWER	CGL1A258Z	1	
15	KNOB,MOMS	CBC1A158MBZG27	1	
16	BRACKET,PCB	CMK2A010	1	
17	PLATE,SHIELD	CMC1A302	1	
18				
19	HOLDER,LED	CMH1A215	1	
20	BRACKET,FIP	CMD1A209	3	
21	CABINET,TOP	CXC4B145S46Z	1	
22	CHASSIS,BOTTOM	CUA2A229	1	
23	RUBBER,CUSHION	CHG1A329	4	
24	FOOT	CKL2A069H43	4	
25	SUPPORT,CUSHION	CHG1A104Z	1	
26	HEAT SINK	CMY1A273	1	
27	BRACKET,PCB	CMD1A417	2	
28	HOLDER,PCB	CHE1A170	2	
29	BRACKET,TRANS	CMD1A487	1	
30	BRACKET,PCB(H/T)	CMD1A398	2	
31	BRACKET,PCB	CMD1A570	1	
32	BRACKET,PCB	CMD1A387	2	
33	PANEL,REAR	CKF8A319Z	1	
34	BUSHING,AC CORD	KHR1A028	1	
35	CORD,POWER	CJA523FBYA	1	
36	TRANS,POWER	CLT5U026ZE	1	
37	FRONT PAB ASS'Y	COP11910H	1	
		37-1 FIP PCB	1	
		37-2 KEY PCB	1	
		37-3 POWER LED PCB	1	
		37-4 MOMS PCB	1	
		37-5 PHONE PCB	1	
		37-6 VOLUME PCB	1	
		37-7 RS232 PCB	1	
		37-8 GUIDE PCB(CARD CABLE)	1	
38	MAIN PCB ASS'Y	COP11911H	1	
		38-1 MAIN PCB	1	
		38-2 GUIDE PCB(CARD CABLE)	1	
39	INPUT PCB ASS'Y	COP11931H	1	
		39-1 INPUT PCB	1	
		39-2 RDS PCB	1	
40	POWER PCB ASS'Y	COP11916H	1	
		40-1 DIGITAL IN PCB	1	
		40-2 REGULATOR PCB(A)	5	
		40-3 TRANS PCB	1	
		40-4 TRANS PCB	1	
		40-5 REGULATOR PCB(B)	1	
41	VIDEO PCB ASS'Y	COP11930H	1	
42	TUNER MODULE	CNVM9014MS171L	1	
43	CUSHION	CHG1A160Z	1	
44	BADGE,HARMAN/KARDON	CGB1A152Z	1	

AVR137/230 Electrical Parts List

Ref. #	Part Number	Description	Value	Qty
	CGB1A152Z	BADGE , HARMAN/KARDON(TOP)	BADGE	1
	CGL1A222	INDICATOR , VOLUME	INDICATOR	1
	CGUAVR137	FRONT WINDOW ASS'Y	ASS'Y	1
	CGB1A183Z	BADGE , HARMAN AVR137/230	BADGE	1
	CGU2A399Y	WINDOW , FIP	FIP WINDOW	1
	CGU1A318Z	ORNAMENT , VOLUME	ORANMENT	1
	CGX1A338MBC	CAP , VOLUME	CAP	1
	CKC4B145S46	CABINET , TOP	TOP CABINET	1
	BKC4C145S46	SHEET , CABINET(350X750)	TOP CABINET	1
	CLZ9Z028Z	FERRITE CORE(21.2X6.4X12.7)	FERRITE CORE	1
	CMH1A214	HOLDER , VOLUME	HOLDER	1
	CMZ2A090	SHEET , VOLUME	SHEET	1
	CQB1A549Y	LABEL , ATTENTION DVD48	LABEL	1
	CQB1A551Z	LABEL , BAR CODE	LABEL	1
	CQB1A622	LABEL , SERIAL NO	LABEL	1
	CRE1A037	LOCKER	LOCKER	10
	CTB3+8JFC	SCREW	SCREW	13
	CTB4+6FFC	SCREW	SCREW	6
	CHE154	CLAMPER , ARM	ASS'Y	0,12
	CPG1A822S	BOX , OFFSET CARTON	BOX	1
	CPS5A564	PAD , SNOW L	SNOW PAD	1
	CPS5A565	PAD , SNOW R	SNOW PAD	1
	CQB1A551Z	LABEL , BAR CODE	LABEL	2
	CQB1A649Z	LABEL , COUNTRY	LABEL	2
	CQS1A001	RIBON , BAR CODE	SONY(TR-4070)	0,12
	CQXAVR137	INSTRUCTION MANUAL ASS'Y	ASS'Y	1
	CABR03P3	BATTERY (SIZE 'AAA') 3PCS IN 1	BATTERY	3
	CARTAVR137/	REMOCON TRANSMITTER ASS'Y	ASS'Y	1
	CGRAVR130/2	COVER ASS'Y	COVER	1
	CGR1A331M7H	COVER A	COVER	1
	CGR1A332M7H	COVER B	COVER	1
	CPS1A676	PAD , COVER	PAD	1
	CQE1A220Z	SHEET , FRONT COVER	SHEET	1
	CQE1A180Z	BOOKLET , IMFORMATIONS	CARD	1
	CQX1A1256Z	MANUAL , SET UP AVR147/230	MANUAL	1
	CQX1A1260Z	MANUAL , INSTRUCTION AVR137/230	MANUAL	1
	CSA1A018Z	FM 1 POLE ANT	ANT	1
	CSA1A027Z	AM LOOP ANT	ANT	1
	HQE1A273Z	HARMAN IMAGE BROCHURES	BROCHURES	1

Ref. #	Part Number	Description	Value	Qty
	CGWAVR137/2	FRONT PANEL ASS'Y	ASS'Y	1
	CBC1A158MBZ	KNOB , MOMS	KNOB	1
	CBT1A1026MM	KNOB , POWER	KNOB	1
	CBT1A1028MB	KNOB , FUNCTION	KNOB	1
	CGL1A258Z	INDICATOR , POWER	INDICATOR	1
	CGW1A427RDZ	PANEL , FRONT	PANEL	1
	CHR301	CLAMPER	CLAMPER	13
	CMC1A302	PLATE , SHIELD	PLATE	1
	CMD2A443	BRACKET , SIDE	BRACKET	2
	CMH2A215	HOLDER , LED AVR350	HOLDER	1
	CMK2A010	BRACKET , PCB	BRACKET	1
	CMZ1A088	FILTER , FIP	FIP FILTER	1
	CMZ1A120	SHEET , REFLECTION	SHEET	1
	CTB3+10GR	SCREW	SCREW	31
	CTB3+16GFZR	SCREW	SCREW	2
	KGB1A158Z	BADGE , HARMAN/KARDON(FRONT)	BADGE	1
CB72	CWC1B2A17A2	WAFER, CARD CABLE (1mm PITCH,B TYPE)	WAFER	1

Ref. #	Part Number	Description	Value	Qty
	COP11910H	FRONT PCB ASS`Y	ASS'Y	1
	CMC3A111	PLATE , EARTH	PLATE	1

C714	HCBS1H151KB	CAP , CERAMIC	150UF 50V K	1
C716	CCEA1AH331T	CAP , ELECT	330UF 10V	1
C719	HCBS1H102KB	CAP , CERAMIC	1000PF 50V K	1
C720	HCBS1H102KB	CAP , CERAMIC	1000PF 50V K	1
C721	HCBS1H102KB	CAP , CERAMIC	1000PF 50V K	1
C723	HCBS1H104ZF	CAP , CERAMIC	0.1UF 50V Z	1
C728	HCBS1H104ZF	CAP , CERAMIC	0.1UF 50V Z	1
C729	HCBS1H473ZF	CAP , CERAMIC	0.047UF 50V Z	1
C731	CCEA1HH100	CAP , ELECT	10UF 50V	1
C735	CCEA1CKS100	CAP , ELECT	10UF 16V	1
C742	HCBS1H223ZF	CAP , CERAMIC	0.02UF 50V Z	1
C793	HCBS1H104ZF	CAP , CERAMIC	0.1UF 50V Z	1
C794	HCBS1C222MX	CAP , CERAMIC	2200PF 16V	1
C795	HCBS1H102KB	CAP , CERAMIC	1000PF 50V K	1
C796	HCBS1H102KB	CAP , CERAMIC	1000PF 50V K	1
C805	HCBS1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
C806	HCBS1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
C807	HCBS1H104ZF	CAP , CERAMIC	0.1UF 50V Z	1
C808	HCBS1H181KB	CAP , CERAMIC	180PF 50V Z	1
C809	CCEA1AH471T	CAP , ELECT	470UF 10V	1
C812	HCBS1H104ZF	CAP , CERAMIC	0.1UF 50V Z	1
C817	HCBS1H100JC	CAP , CERAMIC	10PF 50V	1
C841	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C842	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C843	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C850	HCBS1H471KB	CAP , CERAMIC	470PF 50V	1
C851	HCBS1H471KB	CAP , CERAMIC	470PF 50V	1
C852	HCBS1H104ZF	CAP , CERAMIC	0.1UF 50V Z	1
C855	HCBS1H101KB	CAP , CERAMIC	100PF 50V K	1
C856	HCBS1H101KB	CAP , CERAMIC	100PF 50V K	1
C857	HCBS1H104ZF	CAP , CERAMIC	0.1UF 50V Z	1
C862	HCBS1H101KB	CAP , CERAMIC	100PF 50V K	1
C863	HCBS1H101KB	CAP , CERAMIC	100PF 50V K	1
C866	CCEA1HKS100	CAP , ELECT	10UF 50V SMALL SIZE	1
C867	CCEA1HKS100	CAP , ELECT	10UF 50V SMALL SIZE	1
C868	CCEA1EKS470	CAP , ELECT	47UF 25V	1
C869	CCEA1EKS470	CAP , ELECT	47UF 25V	1
C870	HCBS1H681KB	CAP , CERAMIC	680PF 50V K	1
C871	HCBS1H681KB	CAP , CERAMIC	680PF 50V K	1
C872	CCEA1CH331T	CAP , ELECT	330UF 16V	1
C873	CCEA1CH331T	CAP , ELECT	330UF 16V	1
C874	HCBS1H101KB	CAP , CERAMIC	100PF 50V K	1
C882	HCBS1H104ZF	CAP , CERAMIC	0.1UF 50V Z	1
C889	HCBS1H104ZF	CAP , CERAMIC	0.1UF 50V Z	1
C891	HCBS1H223ZF	CAP , CERAMIC	0.023UF 50V Z	1
C892	HCBS1H223ZF	CAP , CERAMIC	0.023UF 50V Z	1
C893	HCBS1H223ZF	CAP , CERAMIC	0.023UF 50V Z	1
C894	CCEA1CKS100	CAP , ELECT	10UF 16V	1
C896	HCBS1H223ZF	CAP , CERAMIC	0.023UF 50V Z	1
C897	CCEA1AH471T	CAP , ELECT	470UF 10V	1
C901	HCBS1H390JT	CAP , CERAMIC	39PF 50V Z	1
C903	CCEA1HKS2R2	CAP , ELECT	2.2UF 50V	1
C905	CCEA1HKS2R2	CAP , ELECT	2.2UF 50V	1
D730	CVD1SS133MT	DIODE	1SS133	1
D774	CVD1SS133MT	DIODE	1SS133	1
D778	HVD1N5819T	DIODE , SCHOTTKY	1N5819	1
D784	CVD1SS133MT	DIODE	1SS133	1
D785	CVD1SS133MT	DIODE	1SS133	1
L702	HLQ02C100KT	COIL , AXAIL	10uH	1
Q701	HVTKRC107MT	T.R	KRC107M	1
Q722	HVTKRA107MT	T.R	KRA107M	1
Q724	HVTKRC107MT	T.R	KRC107M	1
Q725	HVTKRC107MT	T.R	KRC107M	1
Q734	HVTKTC2874B	T.R , MUTE	KTC2874B	1
Q735	HVTKTC2874B	T.R , MUTE	KTC2874B	1
Q736	HVTKTC2874B	T.R , MUTE	KTC2874B	1
Q737	HVTKTC2874B	T.R , MUTE	KTC2874B	1
Q738	HVTKRC107MT	T.R	KRC107M	1
Q739	HVTKTA1271Y	T.R	KTA1271Y	1
R701	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1

R704	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1
R705	CRD20TJ820T	RES , CARBON	82 OHM 1/5W J	1
R706	CRD20TJ820T	RES , CARBON	82 OHM 1/5W J	1
R708	CRD20TJ820T	RES , CARBON	82 OHM 1/5W J	1
R709	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1
R710	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1
R711	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1
R718	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1
R737	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1
R747	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R753	CRD20TF1001	RES , CARBON	1K /1/5W /F	1
R754	CRD20TF1501	RES , CARBON	1.5K /1/5W /F	1
R755	CRD20TF1801	RES , CARBON	1.8K /1/5W /F	1
R756	CRD20TF2701	RES , CARBON	2.7K /1/5W/F	1
R757	CRD20TF3301	RES , CARBON	3.3K /1/5W/F	1
R758	CRD20TF5601	RES , CARBON(5.6K/F)	5.6K/1/5W/F	1
R759	CRD20TF1001	RES , CARBON	1K /1/5W /F	1
R760	CRD20TF1501	RES , CARBON	1.5K /1/5W /F	1
R761	CRD20TF1801	RES , CARBON	1.8K /1/5W /F	1
R762	CRD20TF2701	RES , CARBON	2.7K /1/5W/F	1
R763	CRD20TF3301	RES , CARBON	3.3K /1/5W/F	1
R764	CRD20TF5601	RES , CARBON(5.6K/F)	5.6K/1/5W/F	1
R765	CRD20TF7501	RES , CARBON (7.5K/F)	7.5K/1/5W/F	1
R766	CRD20TF1001	RES , CARBON	1K /1/5W /F	1
R767	CRD20TF1501	RES , CARBON	1.5K /1/5W /F	1
R768	CRD20TF1801	RES , CARBON	1.8K /1/5W /F	1
R769	CRD20TF2701	RES , CARBON	2.7K /1/5W/F	1
R781	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R783	CRD20TJ102T	RES , CARBON	10K OHM 1/5W J	1
R784	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R786	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R787	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1
R791	CRD20TJ822T	RES , CARBON	8.2K OHM 1/5W J	1
R805	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R806	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
R824	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R825	CRD20TJ681T	RES , CARBON	680 OHM 1/5W J	1
R828	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R829	CRD20TJ681T	RES , CARBON	680 OHM 1/5W J	1
R864	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1
R865	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1
R866	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1
R869	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R871	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R872	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R873	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1
R874	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1
R875	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R876	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R877	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R878	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R892	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1
R893	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1
R895	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1
R896	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1
R897	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1
R898	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1
R899	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R900	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R901	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R902	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R903	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R904	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R905	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R906	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R907	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
R908	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
R909	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R910	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R911	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1

R912	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R913	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R915	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1
R918	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
R919	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
S701	HST1A020ZT	SW , TACT	1A020	1
S702	HST1A020ZT	SW , TACT	1A020	1
S703	HST1A020ZT	SW , TACT	1A020	1
S704	HST1A020ZT	SW , TACT	1A020	1
S705	HST1A020ZT	SW , TACT	1A020	1
S706	HST1A020ZT	SW , TACT	1A020	1
S707	HST1A020ZT	SW , TACT	1A020	1
S711	HST1A020ZT	SW , TACT	1A020	1
S712	HST1A020ZT	SW , TACT	1A020	1
S713	HST1A020ZT	SW , TACT	1A020	1
S714	HST1A020ZT	SW , TACT	1A020	1
S715	HST1A020ZT	SW , TACT	1A020	1
BK71	CMD1A209	BRACKET , FLT	BRACKET	1
BK72	CMD1A209	BRACKET , FLT	BRACKET	1
BK73	CMD1A209	BRACKET , FLT	BRACKET	1
BN10	CWZAVR230BN	WIRE ASS'Y (SHIELD)	WIRE	1
BN18	CWZAVR125BN	WIRE ASS'Y (SHIELD)	WIRE	1
BN22	CWZAVR145BN	WIRE ASS'Y (SHIELD)	WIRE	1
BN41	CWZAVR130BN	WIRE ASS'Y (SHIELD)	WIRE	1
BN81	CWB2C908200	WIRE ASS'Y	WIRE	1
BN84	CWB2B905080	WIRE ASS'Y	WIRE	1
BN85	CWB2B902100	WIRE ASS'Y (ANGLE)	WIRE	1
BN88	CWB2B904100	WIRE ASS'Y	WIRE	1
BN89	CWB2B904100	WIRE ASS'Y	WIRE	1
CN72	CJP17GA193Z	WAFER, CARD CABLE (SMD)	WAFER	1
CN84	CJP05GB46ZY	WAFER	WAFER	1
CN85	CJP02GA19ZY	WAFER , 2PIN	WAFER	1
CN86	CJP02GA89ZM	WAFER	WAFER	1
CN88	CJP04GB46ZY	WAFER	WAFER	1
CN89	CJP04GB46ZY	WAFER	WAFER	1
D701	CVD52CSBBCE	L.E.D , BLUE	L.E.D	1
D703	CVD52CSBBCE	L.E.D , BLUE	L.E.D	1
D705	CVD52CSBBCE	L.E.D , BLUE	L.E.D	1
D723	CVD50BOBBWG	L.E.D , 2 COLOR (ORG , BLUE)	L.E.D	1
D727	CVD50BOBBWG	L.E.D , 2 COLOR (ORG , BLUE)	L.E.D	1
ET03	CMD1A569	BRACKET , PCB	BRACKET	1
FIP1	HFLHCA18ML0	F.I.P	F.I.P	1
IC73	HRVNJL34H38	SENSOR , REMOCON	JRC	1
IC75	HVI74ACT04M	I.C , HEX	FAIRCHILD	1
IC76	HVI74HCU04A	I.C , INVERTER	TOSHICA	1
IC86	HVINJM4556A	I.C , HEADPHONE	JRC	1
JK81	CJJ4M043Y	JACK , BOARD	JACK	1
JK82	HJSTORX177L	MODULE , OPTICAL(RX)	OPT JACK(RX)	1
JK83	CJJ2E026Z	JACK , HEADPHONE(SILVER PLATE)	JACK	1
JK85	CJJ9M003Z	JACK , S-VIDEO	JACK	1
JK86	CJJ4S023Y	JACK , BOARD	JACK	1
JW82	CWE8202300R	WIRE ASS'Y	WIRE	1
JW83	CWE8202150R	WIRE ASS'Y	WIRE	1
JW84	CWE8202110R	WIRE ASS'Y	WIRE	1
SW1	CSH1A008ZV	SW , PUSH (MOMS)	SWITCH	1
VR74	CSR2A037Z	ENCODER	ENCODER	1

Ref. #	Part Number	Description	Value	Qty
	CUAAVR137/2	BOTTOM CHASSIS ASS'Y	ASS'Y	1
	CHD1A012ZR	SCREW , SPECIAL	SCREW	2
	CHD1A023R	SCREW , SPECIAL	SCREW	4
	CHD4A012R	SCREW , SPECIAL	SCREW	5
	CHE170	HOLDER , PCB	HOLDER	2
	CHE36-3	CLAMPER , WIRE	CLAMPER	1
	CHG1A104Z	CUSHUON , RUBBER	CUSHION	1
	CHG1A160Z	CUSHION , RUBBER	CUSHION	1
	CHG1A360	CUSHION , FOOT	CUSHION	4

	CHS1A032	TAPE , HEMELON	TAPE	4
	CJA2B043ZA	CORD , POWER(EUR)	POWER CORD	1
	CKF8A319W	PANEL , REAR AVR137/230	REAR PANEL	1
	CKL2A069H43	FOOT	FOOT	4
	CLZ9W003Z	FERRITE , RING	FERRITE RING	1
	CMD2A487	BRACKET , TRANS	BRACKET	1
	CNVM9014MS1	MODULE , TUNER(EUR)	TUNER	1
	CQB1A173Y	LABEL, FUSE CAUTION	LABEL	1
	CTB3+10GFZR	SCREW	SCREW	17
	CTB3+6JR	SCREW	SCREW	13
	CTB3+8JFZR	SCREW	SCREW	1
	CTB3+8JR	SCREW	SCREW	7
	CTW3+12JR	SCREW	SCREW	2
	CTW3+8JR	SCREW	SCREW	8
	CUA3A229	CHASSIS , BOTTOM AVR350/230	CHASSIS	1
	C2K26161	SOLDER, WIRE	SOLDER, WIRE	5
	KHR1A028	BUSHING , AC CORD	AC CORD	1
CB11	CWC1B2A13A1	CABLE , CARD	CARD CABLE	1
CB12	CWC1C4A21B1	CABLE , CARD	CARD CABLE	1
CB13	CWC1C4A13B0	CABLE , CARD	CARD CABLE	1
CB14	CWC1B2A09A1	WAFER, CARD CABLE (1mm PITCH,B TYPE)	WAFER	1
F901	KBA2C4000TL	FUSE	LITTLE FUSE	1
T901	CLT5U026ZE	TRANS, POWER	MAIN TRANS	1

Ref. #	Part Number	Description	Value	Qty
	COP11911H	MAIN PCB ASS'Y	ASS'Y	1
	CHD3A012R	SCREW , SPECIAL	SCREW	3
	CTW3+8JR	SCREW	SCREW	2
	C8AGB288	BOND (MAX)	BOND	10,2
	CUP11911W	PCB, MAIN AVR350/230(330X247,FR-1)	PCB	1
C501	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C502	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C503	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C504	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C505	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C506	CCKT1H331KB	CAP , CERAMIC	330PF 50V	1
C507	HCBS1H331KB	CAP , CERAMIC	330PF 50V	1
C508	HCBS1H331KB	CAP , CERAMIC	330PF 50V	1
C509	CCKT1H331KB	CAP , CERAMIC	330PF 50V	1
C510	HCBS1H331KB	CAP , CERAMIC	330PF 50V	1
C561	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C562	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C563	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C564	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C565	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C566	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C567	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C568	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C569	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C570	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C571	HCBS1H681KB	CAP , CERAMIC	680PF 50V	1
C572	HCBS1H681KB	CAP , CERAMIC	680PF 50V	1
C573	HCBS1H681KB	CAP , CERAMIC	680PF 50V	1
C574	HCBS1H681KB	CAP , CERAMIC	680PF 50V	1
C575	HCBS1H681KB	CAP , CERAMIC	680PF 50V	1
C601	CCCT1H120JC	CAP , CERAMIC	12PF 50V	1
C602	CCCT1H120JC	CAP , CERAMIC	12PF 50V	1
C603	CCCT1H120JC	CAP , CERAMIC	12PF 50V	1
C604	CCCT1H120JC	CAP , CERAMIC	12PF 50V	1
C605	CCCT1H120JC	CAP , CERAMIC	12PF 50V	1
C606	CCCT1H330JC	CAP , CERAMIC	33PF 50V	1
C607	CCCT1H330JC	CAP , CERAMIC	33PF 50V	1
C608	CCCT1H330JC	CAP , CERAMIC	33PF 50V	1
C609	CCCT1H330JC	CAP , CERAMIC	33PF 50V	1
C610	CCCT1H330JC	CAP , CERAMIC	33PF 50V	1
C681	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C682	CCEA1HH100T	CAP , ELECT	10UF 50V	1

C683	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C684	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C685	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C726	CCKT1H221KB	CAP , CERAMIC	220PF 50V	1
C900	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V	1
C901	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V	1
C905	CCFT1H223ZF	CAP , CERAMIC	0.022UP 50V	1
C907	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C908	CCFT1H223ZF	CAP , CERAMIC	0.1UF 50V ZF	1
C910	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V	1
C911	CCEA1CH471T	CAP , ELECT	470UF 16V	1
C912	CCEA1EH221T	CAP , ELECT	220UF 16V	1
C913	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V ZF	1
C914	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C917	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C924	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V ZF	1
C939	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
C940	CCEA1AH471T	CAP , ELECT	470UF 10V	1
C948	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V ZF	1
C949	CCEA1HH220T	CAP , ELECT	22UF 50V	1
C971	HCQI1H562JZ	CAP , MYLAR	5600PF 50V	1
C972	HCQI1H562JZ	CAP , MYLAR	5600PF 50V	1
C973	HCQI1H562JZ	CAP , MYLAR	5600PF 50V	1
C980	HCQI1H562JZ	CAP , MYLAR	5600PF 50V	1
C981	HCQI1H562JZ	CAP , MYLAR	5600PF 50V	1
C990	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C991	CCEA1HH1R0T	CAP , ELECT	1UF 50V	1
C992	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C993	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C995	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C997	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C999	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V ZF	1
D501	CVD1SS133MT	DIODE	1SS133	1
D502	CVD1SS133MT	DIODE	1SS133	1
D503	CVD1SS133MT	DIODE	1SS133	1
D504	CVD1SS133MT	DIODE	1SS133	1
D505	CVD1SS133MT	DIODE	1SS133	1
D581	CVD1SS133MT	DIODE	1SS133	1
D582	CVD1SS133MT	DIODE	1SS133	1
D583	CVD1SS133MT	DIODE	1SS133	1
D584	CVD1SS133MT	DIODE	1SS133	1
D585	CVD1SS133MT	DIODE	1SS133	1
D901	CVD1N4003SR	DIODE , RECT	1N4003	1
D902	CVD1SS133MT	DIODE	1SS133	1
D911	CVD1SS133MT	DIODE	1SS133	1
D912	CVD1SS133MT	DIODE	1SS133	1
D914	CVD1SS133MT	DIODE	1SS133	1
D917	CVD1SS133MT	DIODE	1SS133	1
D953	CVD1SS133MT	DIODE	1SS133	1
D954	CVD1N4003SR	DIODE , RECT	1N4003	1
D955	CVD1N4003SR	DIODE , RECT	1N4003	1
D956	CVD1N4003SR	DIODE , RECT	1N4003	1
D957	CVD1N4003SR	DIODE , RECT	1N4003	1
D961	CVD1N4003ST	DIODE , RECT	1N4003	1
D962	CVD1N4003SR	DIODE , RECT	1N4003	1
D963	CVD1N4003ST	DIODE , RECT	1N4003	1
D973	CVD1SS133MT	DIODE	1SS133	1
D974	CVD1SS133MT	DIODE	1SS133	1
D979	HVDMTZJ62BT	DIODE , ZENER	MTZJ6.2B	1
D980	CVD1SS133MT	DIODE	1SS133	1
ET90	HJT1A025	PALTE , EARTH	MET37-0002	1
ET91	HJT1A025	PALTE , EARTH	MET37-0002	1
F901	KJCFC5S	HOLDER , FUSE	HOLDER	2
Q501	HVTKTA1268G	T.R	KTA1268GR	1
Q502	HVTKTA1268G	T.R	KTA1268GR	1
Q503	HVTKTA1268G	T.R	KTA1268GR	1
Q504	HVTKTA1268G	T.R	KTA1268GR	1
Q505	HVTKTA1268G	T.R	KTA1268GR	1
Q511	HVTKTC3200G	T.R	KTC3200GR	1
Q512	HVTKTC3200G	T.R	KTC3200GR	1

Q513	HVTKTC3200G	T.R	KTC3200GR	1
Q514	HVTKTC3200G	T.R	KTC3200GR	1
Q515	HVTKTC3200G	T.R	KTC3200GR	1
Q516	HVTKTC3200G	T.R	KTC3200GR	1
Q517	HVTKTC3200G	T.R	KTC3200GR	1
Q518	HVTKTC3200G	T.R	KTC3200GR	1
Q519	HVTKTC3200G	T.R	KTC3200GR	1
Q520	HVTKTC3200G	T.R	KTC3200GR	1
Q541	HVTKTC3198Y	T.R	KTC3198Y	1
Q542	HVTKTC3198Y	T.R	KTC3198Y	1
Q543	HVTKTC3198Y	T.R	KTC3198Y	1
Q544	HVTKTC3198Y	T.R	KTC3198Y	1
Q545	HVTKTC3198Y	T.R	KTC3198Y	1
Q556	HVTKTC3200G	T.R	KTC3200GR	1
Q557	HVTKTC3200G	T.R	KTC3200GR	1
Q558	HVTKTC3200G	T.R	KTC3200GR	1
Q559	HVTKTC3200G	T.R	KTC3200GR	1
Q560	HVTKTC3200G	T.R	KTC3200GR	1
Q561	HVTKTC3200G	T.R	KTC3200GR	1
Q562	HVTKTC3200G	T.R	KTC3200GR	1
Q563	HVTKTC3200G	T.R	KTC3200GR	1
Q564	HVTKTC3200G	T.R	KTC3200GR	1
Q565	HVTKTC3200G	T.R	KTC3200GR	1
Q601	HVTKTA1268G	T.R	KTA1268GR	1
Q602	HVTKTA1268G	T.R	KTA1268GR	1
Q603	HVTKTA1268G	T.R	KTA1268GR	1
Q604	HVTKTA1268G	T.R	KTA1268GR	1
Q605	HVTKTA1268G	T.R	KTA1268GR	1
Q681	HVTKSC2785Y	T.R	KSC2785Y	1
Q682	HVTKSC2785Y	T.R	KSC2785Y	1
Q683	HVTKSC2785Y	T.R	KSC2785Y	1
Q684	HVTKSC2785Y	T.R	KSC2785Y	1
Q685	HVTKSC2785Y	T.R	KSC2785Y	1
Q901	HVTKSC2785Y	T.R	KSC2785Y	1
Q938	HVTKRA107MT	T.R	KRA107M	1
Q939	HVTKRA107MT	T.R	KRA107M	1
Q942	HVTKSC2785Y	T.R	KSC2785Y	1
Q943	HVTKSC2785Y	T.R	KSC2785Y	1
Q951	HVTKRC107MT	T.R	KRC107M	1
Q952	HVTKRA107MT	T.R	KRA107M	1
Q960	HVTKRC107MT	T.R	KRC107M	1
Q961	HVTKTA1024Y	T.R	KTA1024YT	1
Q991	HVTKRC107MT	T.R	KRC107M	1
Q992	HVTKRA107MT	T.R	KRA107M	1
R501	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1
R502	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1
R503	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1
R504	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1
R505	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1
R506	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1
R507	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1
R508	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1
R509	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1
R510	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1
R511	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R512	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R513	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R514	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R515	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R516	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R517	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R518	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R519	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R520	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
R521	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1
R522	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1
R523	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1
R524	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1
R525	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1
R531	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1

R532	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R533	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R534	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R535	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R536	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R537	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R538	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R539	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R540	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
R541	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1
R542	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1
R543	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1
R544	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1
R545	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1
R556	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1
R557	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1
R558	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1
R559	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1
R560	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1
R561	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1
R562	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1
R563	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1
R564	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1
R565	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1
R566	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R567	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R568	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R569	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R570	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R571	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R572	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R573	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R574	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R575	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R576	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1
R577	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1
R578	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1
R579	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1
R580	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1
R581	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R582	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R583	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R584	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R585	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R586	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R587	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R588	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R589	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R590	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R591	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R592	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R593	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R594	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R595	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R596	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R597	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R598	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R599	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R600	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R601	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R602	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R603	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R604	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R605	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R606	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R607	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R608	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R609	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R610	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R631	CRD25FJ180T	RES , CARBON	18 OHM 1/4W	1

R632	CRD25FJ180T	RES , CARBON	18 OHM 1/4W	1
R633	CRD25FJ180T	RES , CARBON	18 OHM 1/4W	1
R634	CRD25FJ180T	RES , CARBON	18 OHM 1/4W	1
R635	CRD25FJ180T	RES , CARBON	18 OHM 1/4W	1
R636	CRD25FJ180T	RES , CARBON	18 OHM 1/4W	1
R637	CRD25FJ180T	RES , CARBON	18 OHM 1/4W	1
R638	CRD25FJ180T	RES , CARBON	18 OHM 1/4W	1
R639	CRD25FJ180T	RES , CARBON	18 OHM 1/4W	1
R640	CRD25FJ180T	RES , CARBON	18 OHM 1/4W	1
R646	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R647	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R648	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R649	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R650	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R651	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R652	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R653	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R654	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R655	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R666	CRD25TJ470T	RES , CARBON	47 OHM 1/4W	1
R667	CRD25TJ470T	RES , CARBON	47 OHM 1/4W	1
R668	CRD25TJ470T	RES , CARBON	47 OHM 1/4W	1
R669	CRD25TJ470T	RES , CARBON	47 OHM 1/4W	1
R670	CRD25TJ470T	RES , CARBON	47 OHM 1/4W	1
R671	CRD20TJ911T	RES , CARBON	910 OHM 1/5W J	1
R672	CRD20TJ911T	RES , CARBON	910 OHM 1/5W J	1
R673	CRD20TJ911T	RES , CARBON	910 OHM 1/5W J	1
R674	CRD20TJ911T	RES , CARBON	910 OHM 1/5W J	1
R675	CRD20TJ911T	RES , CARBON	910 OHM 1/5W J	1
R681	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1
R682	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1
R683	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1
R684	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1
R685	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1
R686	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R687	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R688	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R689	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R690	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R696	CRD25TJ470T	RES , CARBON	47 OHM 1/4W	1
R697	CRD25TJ470T	RES , CARBON	47 OHM 1/4W	1
R698	CRD25TJ470T	RES , CARBON	47 OHM 1/4W	1
R699	CRD25TJ470T	RES , CARBON	47 OHM 1/4W	1
R700	CRD25TJ470T	RES , CARBON	47 OHM 1/4W	1
R771	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R772	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R773	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R774	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R775	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R781	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R782	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R783	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R784	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R785	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R900	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R901	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1
R902	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1
R903	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1
R906	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1
R907	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R910	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	1
R911	CRD25TJ680T	RES , CARBON	68 OHM 1/4W J	1
R912	CRD20TJ332T	RES , CARBON	3.3K OHM 1/5W J	1
R917	CRD25TJ393T	RES , CARBON	39K OHM 1/4W	1
R918	CRD25TJ393T	RES , CARBON	39K OHM 1/4W	1
R919	CRD25TJ393T	RES , CARBON	39K OHM 1/4W	1
R920	CRD25TJ393T	RES , CARBON	39K OHM 1/4W	1
R932	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R939	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
R940	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1

R941	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R942	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R944	CRD25TJ223T	RES , CARBON	22K OHM 1/4W J	1
R946	CRD25TJ223T	RES , CARBON	22K OHM 1/4W J	1
R947	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1
R948	CRD25TJ222T	RES , CARBON	2.2K OHM 1/4W J	1
R949	CRD20TJ822T	RES , CARBON	8.2K OHM 1/5W J	1
R955	CRD20TJ203T	RES , CARBON	20K OHM 1/5W J	1
R956	CRD20TJ394T	RES , CARBON	390K OHM 1/5W J	1
R957	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
R960	CRD20TJ332T	RES , CARBON	3.3K OHM 1/5W J	1
R961	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1
R962	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1
R963	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	1
R966	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
R980	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1
R986	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R987	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1
R988	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1
R989	CRD20TJ302T	RES , CARBON	3K OHM 1/5W J	1
R991	CRD20TJ822T	RES , CARBON	8.2K OHM 1/5W J	1
R992	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1
R998	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
BN19	CWB3FE03250	WIRE ASS'Y	WIRE	1
BN20	CWB3FC04280	WIRE ASS'Y	WIRE	1
BN82	CWB1C902050	WIRE ASS'Y	WIRE	1
BN83	CWB1C902050	WIRE ASS'Y	WIRE	1
BN84	CWB1C902050	WIRE ASS'Y	WIRE	1
BN85	CWB1C902050	WIRE ASS'Y	WIRE	1
BN86	CWB1C902050	WIRE ASS'Y	WIRE	1
BN89	CWB1C902250	WIRE ASS'Y	WIRE	1
BN90	CWB4F232550	WIRE ASS'Y	WIRE	1
BN98	HJP08GA130Z	WAFER	WAFER	1
CN11	CJP13GA117Z	WAFER , CARD CABLE	WAFER	1
CN12	CJP21GA115Z	WAFER , CARD CABLE	WAFER	1
CN61	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1
CN62	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1
CN63	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1
CN64	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1
CN65	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1
CN91	CJP02GA89ZY	WAFER	WAFER	1
CN92	CJP02KA060Z	WAFER	WAFER	1
C631	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C632	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C633	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C634	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C635	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C636	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C637	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C638	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C639	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C640	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C902	CCET50VKL44	CAP , ELECT	4700UF/50V	1
C904	KCKDKS472ME	CAP , CERAMIC(X1/Y2/SC)	0.0047UF/2.5KV	1
C906	CCEA1EH102E	CAP , ELECT	1000UF 25V	1
C909	CCET50VKL44	CAP , ELECT	4700UF/50V	1
C915	CCET50VKL46	CAP , ELECT	6800UF/50V	1
C916	CCET50VKL46	CAP , ELECT	6800UF/50V	1
ET01	CMD1A387	BRACKET , PCB	BRACKET	1
IC94	HVIMC7805C	I.C, REGULATOR	KA7805-ABTU	1
IC97	HVIS80842CN	I.C RESET	S-80842CNY-X	1
JK90	CJJ4M040Z	JACK , BOARD (SW)	JACK	1
JK91	CJJ5R006Z	TERMINAL , SPEAKER	TERMINAL	1
JK92	CJJ5P020Z	TERMINAL , SPEAKER	TERMINAL	1
JW90	CWE8212120V	WIRE , RED	MOLEX-5298	1
JW91	CWE8212180V	WIRE ASS'Y	WIRE	1
JW92	CWEE212080V	WIRE ASS'Y	WIRE	1
JW96	CWE8212180V	WIRE ASS'Y	WIRE	1
L501	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1
L502	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1

L503	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1
L504	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1
L505	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1
Q858	HVT2SA1360O	T.R	2SA1360O	1
Q871	HVT2SA1360O	T.R	2SA1360O	1
Q872	HVT2SA1360O	T.R	2SA1360O	1
Q874	HVT2SA1360O	T.R	2SA1360O	1
Q875	HVT2SA1360O	T.R	2SA1360O	1
Q881	HVT2SC3423O	T.R	2SC3423O	1
Q882	HVT2SC3423O	T.R	2SC3423O	1
Q883	HVT2SC3423O	T.R	2SC3423O	1
Q884	HVT2SC3423O	T.R	2SC3423O	1
Q885	HVT2SC3423O	T.R	2SC3423O	1
RY94	HSL1A008ZE	RELAY	SDT-S-112DMR	1
R656	CRF5EKR27HX	RES , CEMENT	0.27ohm X 2	1
R657	CRF5EKR27HX	RES , CEMENT	0.27ohm X 2	1
R658	CRF5EKR27HX	RES , CEMENT	0.27ohm X 2	1
R659	CRF5EKR27HX	RES , CEMENT	0.27ohm X 2	1
R660	CRF5EKR27HX	RES , CEMENT	0.27ohm X 2	1
R676	CRD25TJ182T	RES , CARBON	1.8K ohm	1
R677	CRD25TJ182T	RES , CARBON	1.8K ohm	1
R678	CRD25TJ182T	RES , CARBON	1.8K ohm	1
R679	CRD25TJ182T	RES , CARBON	1.8K ohm	1
R680	CRD25TJ182T	RES , CARBON	1.8K ohm	1
R905	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1
R990	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1
R993	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1
R995	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1
R997	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1
R999	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1
TH91	KRTP42T7D33	THERMAL SENSOR , POSISTOR	P42T7D330BW20	1
T902	CLT5J033YE	TRANS , SUB	SR-68	1
Ref. #	**CMYAVR137/2**	**HEAT SINK ASS'Y**	**Value**	**Qty**
	CMYAVR144	HEAT SINK ASS'Y	ASS`Y	1
	CTW3+8JR	SCREW	SCREW	2
	C8AGB288	BOND (MAX)	BOND	10,2
	CHD1A012R	SCREW , SPECIAL	SCREW	15
	CHD3A012R	SCREW , SPECIAL	SCREW	3
	CMD1A398	BRACKET , PCB	BRACKET	2
	CMD1A417	BRACKET , PCB	BRACKET	2
	CMY1A273	HEAT SINK	HEAT SINK	1
	CTB3+8JR	SCREW	SCREW	6
Q652	HVT2SB1559P	TR , POWER (DARLINGTON TYPE)	2SB1560	1
Q653	HVT2SB1559P	TR , POWER (DARLINGTON TYPE)	2SB1560	1
Q654	HVT2SB1559P	TR , POWER (DARLINGTON TYPE)	2SB1560	1
Q655	HVT2SB1559P	TR , POWER (DARLINGTON TYPE)	2SB1560	1
Q657	HVT2SD2389P	TR , POWER (DARLINGTON TYPE)	2SB1560	1
Q658	HVT2SD2389P	TR , POWER (DARLINGTON TYPE)	2SB1560	1
Q659	HVT2SD2389P	TR , POWER (DARLINGTON TYPE)	2SB1560	1
Q660	HVT2SD2389P	TR , POWER (DARLINGTON TYPE)	2SB1560	1
Q661	HVT2SB1559P	TR , POWER (DARLINGTON TYPE)	2SB1560	1
Q670	HVT2SD2389P	TR , POWER (DARLINGTON TYPE)	2SB1560	1
Ref. #	**Part Number**	**Description**	**Value**	**Qty**
	COP11916H	POWER PCB ASS'Y	ASS'Y	1
	C8AGB288	BOND (MAX)	BOND	1
	CUP11916X	PCB , POWER AVR145	PCB	1
C104	HCBS1H103ZF	CAP , CERAMIC	0.01UF 50V	1
C105	HCBS1H103ZF	CAP , CERAMIC	0.01UF 50V	1
C106	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V ZF	1
C107	HCBS1H103ZF	CAP , CERAMIC	0.01UF 50V	1
C108	HCBS1H103ZF	CAP , CERAMIC	0.01UF 50V	1
C109	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V ZF	1
C117	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
C118	HCBS1H103ZF	CAP , CERAMIC	0.01UF 50V	1

C119	CCEA1JH470T	CAP , ELECT	63V/47UF/105'C	1
C120	CCEA1JH470T	CAP , ELECT	63V/47UF/105'C	1
C121	HCBS1H103ZF	CAP , CERAMIC	0.01UF 50V	1
C123	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V ZF	1
C125	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V ZF	1
C126	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V ZF	1
C131	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
C750	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C751	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C754	HCBS1H181KB	CAP , CERAMIC	180PF 50V	1
C755	HCBS1H181KB	CAP , CERAMIC	180PF 50V	1
C757	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V ZF	1
C758	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V ZF	1
C760	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V ZF	1
C761	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C851	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C852	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C853	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C854	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C855	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C902	HCBS1H223ZF	CAP , CERAMIC	0.022UF 50V	1
C903	HCBS1H223ZF	CAP , CERAMIC	0.022UF 50V	1
C906	CCEA1CH101T	CAP , ELECT	0.022UF 50V	1
C907	CCEA1CH101T	CAP , ELECT	0.022UF 50V	1
C908	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C919	CCKT1H102KB	CAP , CERAMIC	1000PF 50V	1
C920	CCEA1HH470T	CAP , ELECT	47UF 50V	1
C921	HCQI1H104JZ	CAP , MYLAR	0.1UF 50V J	1
C922	HCQI1H104JZ	CAP , MYLAR	0.1UF 50V J	1
C923	HCQI1H104JZ	CAP , MYLAR	0.1UF 50V J	1
C924	HCQI1H104JZ	CAP , MYLAR	0.1UF 50V J	1
C925	HCQI1H103JZ	CAP , MYLAR	0.01UF 50V J	1
C926	HCQI1H103JZ	CAP , MYLAR	0.01UF 50V J	1
C927	HCQI1H103JZ	CAP , MYLAR	0.01UF 50V J	1
C928	HCQI1H103JZ	CAP , MYLAR	0.01UF 50V J	1
C931	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C932	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C933	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C934	HCQI1H473JZ	CAP , MYLAR	0.047UF 50V J	1
C935	HCBS1H223ZF	CAP , CERAMIC	0.022UF 50V	1
C936	HCBS1H223ZF	CAP , CERAMIC	0.022UF 50V	1
C937	HCBS1H223ZF	CAP , CERAMIC	0.022UF 50V	1
C938	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C939	CCEA1EH101T	CAP , ELECT	100UF 25V	1
C940	CCEA1EH101T	CAP , ELECT	100UF 25V	1
D101	HVDMTZJ15BT	DIODE , ZENER	MTZJ15B 1/2W	1
D102	HVDMTZJ27BT	DIODE , ZENER	MTZJ27B 1/2W	1
D104	CVD1N4003ST	DIODE , RECT	1N4003	1
D105	CVD1N4003ST	DIODE , RECT	1N4003	1
D108	CVD1N4003ST	DIODE , RECT	1N4003	1
D109	HVDMTZJ12BT	DIODE , ZENER	MTZJ12B 1/2W	1
D111	HVDMTZJ12BT	DIODE , ZENER	MTZJ12B 1/2W	1
D112	CVD1N4003ST	DIODE , RECT	1N4003	1
D113	CVD1N4003ST	DIODE , RECT	1N4003	1
D114	CVD1N4003ST	DIODE , RECT	1N4003	1
D115	CVD1N4003ST	DIODE , RECT	1N4003	1
D116	CVD1N4003ST	DIODE , RECT	1N4003	1
D117	CVD1N4003ST	DIODE , RECT	1N4003	1
D118	CVD1N4003ST	DIODE , RECT	1N4003	1
D119	CVD1N4003ST	DIODE , RECT	1N4003	1
D120	CVD1N4003ST	DIODE , RECT	1N4003	1
D121	CVD1N4003ST	DIODE , RECT	1N4003	1
D124	CVD1N4003ST	DIODE , RECT	1N4003	1
D125	CVD1N4003ST	DIODE , RECT	1N4003	1
Q104	HVTKSC2316Y	T.R	KSC2316Y	1
Q911	HVTKTA1267Y	T.R	KTA1267Y	1
Q912	HVTKTC3198Y	T.R	KTC3198Y	1
Q913	HVTKTC3198Y	T.R	KTC3198Y	1
R101	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1
R108	CRD20TJ4R7T	RES , CARBON	4.7 OHM 1/5W J	1

R109	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1
R110	CRD20TJ4R7T	RES , CARBON	4.7 OHM 1/5W J	1
R112	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1
R113	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1
R120	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R750	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R751	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R757	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R758	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R765	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R766	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
R767	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
R768	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
R770	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R771	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R772	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R776	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R874	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1
R875	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1
R876	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1
R877	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1
R878	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1
R882	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1
R883	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1
R884	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1
R885	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1
R886	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1
R912	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
R913	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
R917	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
R918	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
R919	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
R920	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
R921	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
R922	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
R923	CRD25TJ153T	RES , CARBON	15K OHM 1/4W J	1
R924	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
R925	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
R926	CRD25TJ103T	RES , CARBON	10K OHM 1/4W J	1
R927	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
R928	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1
VR81	HVN1RA221B0	RES , SEMI FIXED(220 OHM)	RH0615C100221	1
VR82	HVN1RA221B0	RES , SEMI FIXED(220 OHM)	RH0615C100221	1
VR83	HVN1RA221B0	RES , SEMI FIXED(220 OHM)	RH0615C100221	1
VR84	HVN1RA221B0	RES , SEMI FIXED(220 OHM)	RH0615C100221	1
VR85	HVN1RA221B0	RES , SEMI FIXED(220 OHM)	RH0615C100221	1
BN17	CJP12GB143Z	PIN HEADER , DIP SOCKET(12PIN,2.54MM,ANGLE)	DIP SOCKET	1
BN20	CWB1C905220	WIRE ASS'Y (2.5mm Pitch, 220mm)	2.5MM PITCH, 220MM	1
BN43	CWB1C904200	WIRE ASS'Y	WIRE	1
BN95	CWB1C903080	WIRE ASS'Y	WIRE	1
BN96	CWB1C909150	WIRE ASS'Y	WIRE	1
BN99	CWB1B908270	WIRE ASS'Y	WIRE	1
CN13	CJP05GA01ZY	WAFER(YMW025-05R)	WAFER	1
CN19	CJP03GA90ZY	WAFER	WAFER	1
CN20	CJP04GA90ZM	WAFER	WAFER	1
CN31	CJP02GA19ZY	WAFER , 2PIN	WAFER	1
CN32	CJP02GA19ZY	WAFER , 2PIN	WAFER	1
CN33	CJP02GA19ZY	WAFER , 2PIN	WAFER	1
CN34	CJP02GA19ZY	WAFER , 2PIN	WAFER	1
CN35	CJP02GA19ZY	WAFER , 2PIN	WAFER	1
CN81	CJP08GA01ZY	WAFER, STRAIGHT, 8PIN	WAFER	1
CN89	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1
CN95	CJP03GA19ZY	WAFER , STRAIGHT, 3PIN	WAFER	1
CN96	CJP09GA01ZY	CON WAFER YMW025-09R	WAFER	1
CN98	HJP08GB131Z	WAFER	WAFER	1
CN99	CJP08GA19ZY	WAFER, STRAIGHT, 8PIN	WAFER	1
C122	CCEA1JH101E	CAP , ELECT	100UF 63V	1
C124	CCEA1VH102E	CAP , ELECT	1000UF 35V	1
C128	CCEA1EH102E	CAP , ELECT	1000UF 25V	1
C129	CCEA1EH222E	CAP , ELECT	2200UF 25V	1

C912	CCEA0JKR322	CAP , ELECT	2200UF 6.3V	1
C929	CCEA1VH102E	CAP , ELECT	1000UF 35V	1
C930	CCEA1VH102E	CAP , ELECT	1000UF 35V	1
C941	CCEA1CH682E	CAP , ELECT	6800UF 16V	1
D991	HVDKBU804F	DIODE , BRIDGE	KBU804F	1
D992	HVDKBU804F	DIODE , BRIDGE	KBU804F	1
IC72	HVI74HCU04A	I.C , INVERTER	TC74HCU04AFNG(TOSHIBA)	1
IC89	HVIL7805CP	I.C, REGULATOR	ST	1
IC90	HVIL7815CP	I.C, REGULATOR	ST	1
IC91	HVIL7915CP	I.C, REGULATOR	ST	1
IC93	HVIL7905CP	I.C, REGULATOR	ST	1
IC94	HVIL7805CP	I.C, REGULATOR	ST	1
IC95	HVINJM7809F	IC , REGULATOR	ST	1
JK75	HJSTORX177L	MODULE , OPTICAL(RX)	OPT JACK(RX)	1
JK76	HJSTORX177L	MODULE , OPTICAL(RX)	OPT JACK(RX)	1
JK79	CJJ4N068Z	JACK , BOARD	JACK	1
Q851	HVTKTD600KG	T.R , BIAS	KTD600KGR	1
Q852	HVTKTD600KG	T.R , BIAS	KTD600KGR	1
Q853	HVTKTD600KG	T.R , BIAS	KTD600KGR	1
Q854	HVTKTD600KG	T.R , BIAS	KTD600KGR	1
Q855	HVTKTD600KG	T.R , BIAS	KTD600KGR	1
R104	KRQ1AJR47H	RES , FUSE	0.47 OHM 1W J	1
R105	KRQ1AJR47H	RES , FUSE	0.47 OHM 1W J	1
R106	CRQ1AJR33H	RES , FUSE	0.33 OHM 1W J	1
R107	CRQ1AJR33H	RES , FUSE	0.33 OHM 1W J	1
R114	KRQ1AJR47H	RES , FUSE	0.47 OHM 1W J	1
R115	KRQ1AJR47H	RES , FUSE	0.47 OHM 1W J	1
R116	CRQ1AJR33H	RES , FUSE	0.33 OHM 1W J	1
R117	CRQ1AJR33H	RES , FUSE	0.33 OHM 1W J	1
R893	CRD20TJ301T	RES , CARBON	300OHM 1/5W J	1
R894	CRD20TJ301T	RES , CARBON	300OHM 1/5W J	1
R895	CRD20TJ301T	RES , CARBON	300OHM 1/5W J	1
R896	CRD20TJ301T	RES , CARBON	300OHM 1/5W J	1
R897	CRD20TJ301T	RES , CARBON	300OHM 1/5W J	1

Ref. #	Part Number	Description	Value	Qty
	COP11930H	VIDEO PCB ASS'Y	ASS'Y	1
	C8AGB288	BOND (MAX)	BOND	0,5
	CUP11930Z	PCB , VIDEO	PCB	0,5
C401	CUP11930Z	CAP , CERAMIC	100PF	1
C402	HCBS1H101KB	CAP , CERAMIC	100PF	1
C403	HCBS1H101KB	CAP , CERAMIC	100PF	1
C411	CCEA1HH100T	CAP , ELECT	10UF	1
C412	CCEA1HH100T	CAP , ELECT	10UF	1
C413	CCEA1HH100T	CAP , ELECT	10UF	1
C421	CCEA1HH100T	CAP , ELECT	10UF	1
C422	CCEA1HH100T	CAP , ELECT	10UF	1
C423	CCEA1HH100T	CAP , ELECT	10UF	1
C451	CCEA1HH100T	CAP , ELECT	10UF	1
C452	CCEA1HH100T	CAP , ELECT	10UF	1
C453	CCEA1HH100T	CAP , ELECT	10UF	1
C461	HCBS1H223ZF	CAP , CERAMIC	0.02UF 50V Z	1
C462	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C463	HCBS1H223ZF	CAP , CERAMIC	0.02UF 50V Z	1
C464	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C466	HCBS1H223ZF	CAP , CERAMIC	0.02UF 50V Z	1
C467	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C468	HCBS1H223ZF	CAP , CERAMIC	0.02UF 50V Z	1
C469	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C471	HCBS1H223ZF	CAP , CERAMIC	0.02UF 50V Z	1
C472	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C473	HCBS1H223ZF	CAP , CERAMIC	0.02UF 50V Z	1
C474	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C491	HCBS1H101KB	CAP , CERAMIC	100PF 50V K	1
C492	HCBS1H101KB	CAP , CERAMIC	100PF 50V K	1
C493	HCBS1H101KB	CAP , CERAMIC	100PF 50V K	1
C601	HCBS1H220JC	CAP , CERAMIC	22PF 50V	1

C602	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1
C603	HCBS1H220JC	CAP , CERAMIC	22PF 50V	1
C604	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1
C605	HCBS1H220JC	CAP , CERAMIC	22PF 50V	1
C606	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1
C611	HCBS1H220JC	CAP , CERAMIC	22PF 50V	1
C612	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C613	HCBS1H220JC	CAP , CERAMIC	22PF 50V	1
C614	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C615	HCBS1H220JC	CAP , CERAMIC	22PF 50V	1
C616	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C621	HCBS1H220JC	CAP , CERAMIC	22PF 50V	1
C622	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C623	HCBS1H220JC	CAP , CERAMIC	22PF 50V	1
C624	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C625	HCBS1H220JC	CAP , CERAMIC	22PF 50V	1
C626	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C671	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C672	HCBS1H104ZF	CAP , CERAMIC	0.1UF 50V Z	1
C673	CCEA1HH100T	CAP , ELECT	10UF 50V	1
R401	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R402	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R403	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R411	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R412	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R413	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R421	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R422	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R423	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R451	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R452	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R453	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R461	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R466	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R471	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
R491	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R492	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R493	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R601	CRD20TJ680T	RES , CARBON	68 OHM 1/5W J	1
R603	CRD20TJ560T	RES , CARBON	56 OHM 1/5W J	1
R605	CRD20TJ620T	RES , CARBON	1/5W 62 OHM	1
R611	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R612	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R613	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R621	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R622	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
R623	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
CN14	CJP09GA117Z	WAFER	WAFER	1
CN41	CJP06GA19ZY	WAFER , STRAIGHT DVD LOADER	WAFER	1
CN43	CJP04GA01ZY	WAFER, STRAIGHT, 4PIN	WAFER	1
IC41	CVINJM2595M	I.C , VIDEO S/W	JRC	1
IC42	CVINJM2595M	I.C , VIDEO S/W	JRC	1
IC43	CVINJM2595M	I.C , VIDEO S/W	JRC	1
IC61	CVINJW1321F	I.C , VIDEO S/W	JRC	1
JK40	CJJ9P003Z	JACK , (S-VIDEO + CVBS)	JACK	1
JK41	CJJ9R001Z	JACK , (S-VIDEO + CVBS)	JACK	1
JK62	CJJ4R045Z	JACK , BOARD	JACK	1
JK69	CJJ4S030Z	JACK , BOARD	JACK	1

Ref. #	Part Number	Description	Value	Qty
	COP11931H	INPUT PCB ASS'Y	ASS'Y	1
C201	CCUS1H221JA	CAP , CHIP	220PF	1
C202	CCUS1H221JA	CAP , CHIP	220PF	1
C203	CCUS1H221JA	CAP , CHIP	220PF	1
C204	CCUS1H221JA	CAP , CHIP	220PF	1
C205	CCUS1H221JA	CAP , CHIP	220PF	1
C206	CCUS1H221JA	CAP , CHIP	220PF	1

C209	CCUS1H221JA	CAP , CHIP	220PF	1
C210	CCUS1H221JA	CAP , CHIP	220PF	1
C211	CCUS1H221JA	CAP , CHIP	220PF	1
C212	CCUS1H221JA	CAP , CHIP	220PF	1
C213	CCUS1H221JA	CAP , CHIP	220PF	1
C214	CCUS1H221JA	CAP , CHIP	220PF	1
C215	CCUS1H221JA	CAP , CHIP	220PF	1
C216	CCUS1H221JA	CAP , CHIP	220PF	1
C219	CCUS1H221JA	CAP , CHIP	220PF	1
C220	CCUS1H221JA	CAP , CHIP	220PF	1
C221	CCUS1H221JA	CAP , CHIP	220PF	1
C222	CCUS1H221JA	CAP , CHIP	220PF	1
C223	CCUS1H221JA	CAP , CHIP	220PF	1
C224	CCUS1H221JA	CAP , CHIP	220PF	1
C260	CCUS1H104KC	CAP , CHIP	0.1UF	1
C269	CCUS1A105KC	CAP , CHIP	1UF	1
C274	CCUS1A105KC	CAP , CHIP	1UF	1
C277	CCUS1H104KC	CAP , CHIP	0.1UF	1
C279	CCUS1H104KC	CAP , CHIP	0.1UF	1
C280	CCUS1H104KC	CAP , CHIP	0.1UF	1
C289	CCUS1H104KC	CAP , CHIP	0.1UF	1
C290	CCUS1H104KC	CAP , CHIP	0.1UF	1
C291	CCUS1H104KC	CAP , CHIP	0.1UF	1
C293	CCUS1H104KC	CAP , CHIP	0.1UF	1
C299	CCUS1H104KC	CAP , CHIP	0.1UF	1
C301	CCUS1H471JA	CAP , CHIP	470PF	1
C302	CCUS1H471JA	CAP , CHIP	470PF	1
C303	CCUS1H471JA	CAP , CHIP	470PF	1
C304	CCUS1H471JA	CAP , CHIP	470PF	1
C305	CCUS1H471JA	CAP , CHIP	470PF	1
C306	CCUS1H471JA	CAP , CHIP	470PF	1
C309	CCUS1H332KC	CAP , CHIP	3300PF	1
C310	CCUS1H332KC	CAP , CHIP	3300PF	1
C311	CCUS1H332KC	CAP , CHIP	3300PF	1
C312	CCUS1H332KC	CAP , CHIP	3300PF	1
C313	CCUS1H332KC	CAP , CHIP	3300PF	1
C314	CCUS1H332KC	CAP , CHIP	3300PF	1
C317	CCUS1H223KC	CAP , CHIP	0.022UF	1
C318	CCUS1H223KC	CAP , CHIP	0.022UF	1
C319	CCUS1H223KC	CAP , CHIP	0.022UF	1
C321	CCUS1H561JA	CAP , CHIP	560PF	1
C322	CCUS1H561JA	CAP , CHIP	560PF	1
C323	CCUS1H561JA	CAP , CHIP	560PF	1
C324	CCUS1H561JA	CAP , CHIP	560PF	1
C325	CCUS1H561JA	CAP , CHIP	560PF	1
C326	CCUS1H561JA	CAP , CHIP	560PF	1
C327	CCUS1H561JA	CAP , CHIP	560PF	1
C328	CCUS1H561JA	CAP , CHIP	560PF	1
C329	CCUS1H561JA	CAP , CHIP	560PF	1
C330	CCUS1H561JA	CAP , CHIP	560PF	1
C331	CCUS1H561JA	CAP , CHIP	560PF	1
C332	CCUS1H561JA	CAP , CHIP	560PF	1
C337	CCUS1H223KC	CAP , CHIP	0.022UF	1
C338	CCUS1H223KC	CAP , CHIP	0.022UF	1
C339	CCUS1H223KC	CAP , CHIP	0.022UF	1
C350	CCUS1H332KC	CAP , CHIP	3300PF	1
C351	CCUS1H332KC	CAP , CHIP	3300PF	1
C352	CCUS1H332KC	CAP , CHIP	3300PF	1
C353	CCUS1H332KC	CAP , CHIP	3300PF	1
C354	CCUS1H332KC	CAP , CHIP	3300PF	1
C355	CCUS1H332KC	CAP , CHIP	3300PF	1
C369	CCUS1H223KC	CAP , CHIP	0.022UF	1
C370	CCUS1H223KC	CAP , CHIP	0.022UF	1
C381	CCUS1H223KC	CAP , CHIP	0.022UF	1
C382	CCUS1H223KC	CAP , CHIP	0.022UF	1
C383	CCUS1H223KC	CAP , CHIP	0.022UF	1
C384	CCUS1H223KC	CAP , CHIP	0.022UF	1
C385	CCUS1H223KC	CAP , CHIP	0.022UF	1
C386	CCUS1H223KC	CAP , CHIP	0.022UF	1
C391	CCUS1H151JA	CAP , CHIP	150PF	1

C392	CCUS1H151JA	CAP , CHIP	150PF	1
C393	CCUS1H151JA	CAP , CHIP	150PF	1
C394	CCUS1H102KC	CAP , CHIP	1000PF	1
C395	CCUS1H151JA	CAP , CHIP	150PF	1
C396	CCUS1H151JA	CAP , CHIP	150PF	1
C601	CCUS1H104KC	CAP , CHIP	0.1UF	1
C603	CCUS1H104KC	CAP , CHIP	0.1UF	1
C605	CCUS1H104KC	CAP , CHIP	0.1UF	1
C607	CCUS1H104KC	CAP , CHIP	0.1UF	1
C609	CCUS1H104KC	CAP , CHIP	0.1UF	1
C611	CCUS1H104KC	CAP , CHIP	0.1UF	1
C613	CCUS1H104KC	CAP , CHIP	0.1UF	1
C615	CCUS1H104KC	CAP , CHIP	0.1UF	1
C617	CCUS1H104KC	CAP , CHIP	0.1UF	1
C619	CCUS1H104KC	CAP , CHIP	0.1UF	1
C621	CCUS1H104KC	CAP , CHIP	0.1UF	1
C623	CCUS1H104KC	CAP , CHIP	0.1UF	1
C625	CCUS1H104KC	CAP , CHIP	0.1UF	1
C627	CCUS1H104KC	CAP , CHIP	0.1UF	1
C629	CCUS1H104KC	CAP , CHIP	0.1UF	1
C631	CCUS1H104KC	CAP , CHIP	0.1UF	1
C701	CCUS1H150JA	CAP , CHIP(15PF/50V)	15PF	1
C702	CCUS1H150JA	CAP , CHIP(15PF/50V)	15PF	1
C704	CCUS1H104KC	CAP , CHIP	0.1UF	1
C705	CCUS1H104KC	CAP , CHIP	0.1UF	1
C707	CCUS1H102KC	CAP , CHIP	1000PF	1
C708	CCUS1H104KC	CAP , CHIP	0.1UF	1
C709	CCUS1H102KC	CAP , CHIP	1000PF	1
C711	CCUS1H102KC	CAP , CHIP	1000PF	1
C712	CCUS1H223KC	CAP , CHIP	0.022UF	1
C713	CCUS1H390JA	CAP , CHIP	39PF	1
C714	CCUS1H390JA	CAP , CHIP	39PF	1
C718	CCUS1H104KC	CAP , CHIP	0.1UF	1
C719	CCUS1H104KC	CAP , CHIP	0.1UF	1
C722	CCUS1H104KC	CAP , CHIP	0.1UF	1
C723	CCUS1H473KC	CAP , CHIP	0.047UF	1
C725	CCUS1H104KC	CAP , CHIP	0.1UF	1
C727	CCUS1H104KC	CAP , CHIP	0.1UF	1
C729	CCUS1H104KC	CAP , CHIP	0.1UF	1
C731	CCUS1H104KC	CAP , CHIP	0.1UF	1
C733	CCUS1H104KC	CAP , CHIP	0.1UF	1
C734	CCUS1H102KC	CAP , CHIP	1000PF	1
C735	CCUS1H470JA	CAP , CHIP	47PF	1
C738	CCUS1A105KC	CAP , CHIP	1UF	1
C739	CCUS1H103KC	CAP , CHIP	0.01UF	1
C741	CCUS1H104KC	CAP , CHIP	0.1UF	1
C742	CCUS1H180JA	CAP , CHIP(18PF/50V)	18PF	1
C743	CCUS1H104KC	CAP , CHIP	0.1UF	1
C744	CCUS1H180JA	CAP , CHIP(18PF/50V)	0.1UF	1
C745	CCUS1H104KC	CAP , CHIP	0.1UF	1
C746	CCUS1H104KC	CAP , CHIP	0.1UF	1
C747	CCUS1H104KC	CAP , CHIP	0.1UF	1
C748	CCUS1H104KC	CAP , CHIP	0.1UF	1
C751	CCUS1H104KC	CAP , CHIP	0.1UF	1
C755	CCUS1H561JA	CAP , CHIP	0.1UF	1
C757	CCUS1H104KC	CAP , CHIP	0.1UF	1
C760	CCUS1H104KC	CAP , CHIP	0.1UF	1
C761	CCUS1H104KC	CAP , CHIP	0.1UF	1
C765	CCUS1H104KC	CAP , CHIP	0.1UF	1
C768	CCUS1H104KC	CAP , CHIP	0.1UF	1
C769	CCUS1H104KC	CAP , CHIP	0.1UF	1
C770	CCUS1H104KC	CAP , CHIP	0.1UF	1
C771	CCUS1H104KC	CAP , CHIP	0.1UF	1
C772	CCUS1H104KC	CAP , CHIP	0.1UF	1
C773	CCUS1H104KC	CAP , CHIP	0.1UF	1
D201	CVD1SS355T	DIODE , CHIP	1SS355T	1
D202	CVD1SS355T	DIODE , CHIP	1SS355T	1
D203	CVD1SS355T	DIODE , CHIP	1SS355T	1
D204	CVD1SS355T	DIODE , CHIP	1SS355T	1
D207	CVD1SS355T	DIODE , CHIP	1SS355T	1

D208	CVD1SS355T	DIODE , CHIP	1SS355T	1
D209	CVD1SS355T	DIODE , CHIP	1SS355T	1
D210	CVD1SS355T	DIODE , CHIP	1SS355T	1
D211	CVD1SS355T	DIODE , CHIP	1SS355T	1
D212	CVD1SS355T	DIODE , CHIP	1SS355T	1
D213	CVD1SS355T	DIODE , CHIP	1SS355T	1
D214	CVD1SS355T	DIODE , CHIP	1SS355T	1
D215	CVD1SS355T	DIODE , CHIP	1SS355T	1
D216	CVD1SS355T	DIODE , CHIP	1SS355T	1
IC20	CVINJW1197F	IC , SW(WITH VOLUME)	NJW1197FC2	1
IC21	HVINJM2068M	I.C , OP AMP	NJM2068MD-TE1	1
IC22	HVINJM2068M	I.C , OP AMP	NJM2068MD-TE1	1
IC23	HVINJM2068M	I.C , OP AMP	NJM2068MD-TE1	1
IC25	HVINJM2068M	I.C , OP AMP	NJM2068MD-TE1	1
IC31	HVINJM2068M	I.C , OP AMP	NJM2068MD-TE1	1
IC32	HVINJM2068M	I.C , OP AMP	NJM2068MD-TE1	1
IC33	HVINJM2068M	I.C , OP AMP	NJM2068MD-TE1	1
IC72	HVI74HCU04A	I.C , INVERTER	TC74HCU04AFNG(TOSHIBA)	1
IC73	HVIAK4589VQ	I.C , CODEC + DIR	AK4589VQ	1
IC74	HVILC72723M	IC , PLL (RDS)	SANYO	1
IC75	CVICS49510C	I.C , DSP	CIRRUS LOGIC	1
IC76	HVIM29W800D	I.C, 4M FLASH MEMORY		1
IC78	HVINJM2391D	I.C , CHIP REGULATOR (+3.3V)	JRC	1
IC79	HVILM1117S1	I.C , REGULATOR (1.8V)	LM1117-1V8	1
IC88	HVILM1117S3	I.C , REGULATOR (3.3V)	1117S-3.3V	1
IC89	CVIM24C32WM	I.C , EEPROM (32 Kbit)	ST	1
IC90	CVIT5CC1	I.C , FLASH U-COM	TOSHIBA	1
IC91	HVI74ACT04M	I.C , HEX	TOSHIBA	1
L701	HLZ9Z014Z	CHIP , BEAD	HU-1H4516-600JT	1
L702	HLZ9Z014Z	CHIP , BEAD	HU-1H4516-600JT	1
L703	HLZ9Z014Z	CHIP , BEAD	HU-1H4516-600JT	1
L704	HLZ9R005Z	BEAD CHIP 60(1608 SIZE)	HH-1M1608-600	1
L705	HLZ9R005Z	BEAD CHIP 60(1608 SIZE)	HH-1M1608-600	1
Q729	HVTKRC107S	T.R , CHIP	KRC107S	1
Q730	HVTKRC107S	T.R , CHIP	KRC107S	1
Q732	HVTKRC107S	T.R , CHIP	KRC107S	1
Q734	HVTKRC107S	T.R , CHIP	KRC107S	1
RN61	CRJ104DJ103	RES, ARRAY, 10K (1608)	10K OHM/1608*4	1
RN62	CRJ104DJ103	RES, ARRAY, 10K (1608)	10K OHM/1608*4	1
RN63	CRJ104DJ103	RES, ARRAY, 10K (1608)	10K OHM/1608*4	1
RN64	CRJ104DJ101	RES , CHIP NETWORK(1/16W, 100 ohm,1608*4)	100 OHM/1608*4	1
RN65	CRJ104DJ101	RES , CHIP NETWORK(1/16W, 100 ohm,1608*4)	100 OHM/1608*4	1
RN66	CRJ104DJ101	RES , CHIP NETWORK(1/16W, 100 ohm,1608*4)	100 OHM/1608*4	1
RN71	CRJ104DJ103	RES, ARRAY, 10K (1608)	10K OHM/1608*4	1
RN72	CRJ104DJ103	RES, ARRAY, 10K (1608)	10K OHM/1608*4	1
RN73	CRJ104DJ103	RES, ARRAY, 10K (1608)	10K OHM/1608*4	1
RN74	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN75	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN76	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN77	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN78	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN79	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN80	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN81	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN82	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN83	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN84	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN85	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN86	CRJ104DJ103	RES, ARRAY, 10K (1608)	10K OHM/1608*4	1
RN87	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN88	CRJ104DJ103	RES, ARRAY, 10K (1608)	10K OHM/1608*4	1
RN89	CRJ104DJ103	RES, ARRAY, 10K (1608)	10K OHM/1608*4	1
RN90	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN91	CRJ104DJ330	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1
RN92	CRJ104DJ101	RES , CHIP NETWORK(1/16W, 100 ohm,1608*4)	100 OHM/1608*4	1
R201	CRJ10DJ101T	RES , CHIP	100 OHM	1
R202	CRJ10DJ101T	RES , CHIP	100 OHM	1
R203	CRJ10DJ101T	RES , CHIP	100 OHM	1
R204	CRJ10DJ101T	RES , CHIP	100 OHM	1
R205	CRJ10DJ101T	RES , CHIP	100 OHM	1

R206	CRJ10DJ101T	RES , CHIP	100 OHM	1
R209	CRJ10DJ101T	RES , CHIP	100 OHM	1
R210	CRJ10DJ101T	RES , CHIP	100 OHM	1
R211	CRJ10DJ101T	RES , CHIP	100 OHM	1
R212	CRJ10DJ101T	RES , CHIP	100 OHM	1
R213	CRJ10DJ101T	RES , CHIP	100 OHM	1
R214	CRJ10DJ101T	RES , CHIP	100 OHM	1
R215	CRJ10DJ101T	RES , CHIP	100 OHM	1
R216	CRJ10DJ101T	RES , CHIP	100 OHM	1
R219	CRJ10DJ101T	RES , CHIP	100 OHM	1
R220	CRJ10DJ101T	RES , CHIP	100 OHM	1
R221	CRJ10DJ101T	RES , CHIP	100 OHM	1
R222	CRJ10DJ101T	RES , CHIP	100 OHM	1
R223	CRJ10DJ101T	RES , CHIP	100 OHM	1
R224	CRJ10DJ272T	RES , CHIP	2.7K OHM	1
R227	CRJ10DJ474T	RES , CHIP	470K OHM	1
R228	CRJ10DJ474T	RES , CHIP	470K OHM	1
R229	CRJ10DJ474T	RES , CHIP	470K OHM	1
R230	CRJ10DJ474T	RES , CHIP	470K OHM	1
R231	CRJ10DJ474T	RES , CHIP	470K OHM	1
R232	CRJ10DJ474T	RES , CHIP	470K OHM	1
R235	CRJ10DJ474T	RES , CHIP	470K OHM	1
R236	CRJ10DJ474T	RES , CHIP	470K OHM	1
R237	CRJ10DJ474T	RES , CHIP	470K OHM	1
R238	CRJ10DJ474T	RES , CHIP	470K OHM	1
R239	CRJ10DJ474T	RES , CHIP	470K OHM	1
R240	CRJ10DJ474T	RES , CHIP	470K OHM	1
R241	CRJ10DJ474T	RES , CHIP	470K OHM	1
R242	CRJ10DJ474T	RES , CHIP	470K OHM	1
R245	CRJ10DJ474T	RES , CHIP	470K OHM	1
R246	CRJ10DJ474T	RES , CHIP	470K OHM	1
R247	CRJ10DJ474T	RES , CHIP	470K OHM	1
R248	CRJ10DJ474T	RES , CHIP	470K OHM	1
R249	CRJ10DJ474T	RES , CHIP	470K OHM	1
R250	CRJ10DJ103T	RES , CHIP	10K OHM	1
R253	CRJ10DJ4R7T	RES , CHIP	4.7 OHM	1
R254	CRJ10DJ4R7T	RES , CHIP	4.7 OHM	1
R256	CRJ10DJ4R7T	RES , CHIP	4.7 OHM	1
R257	CRJ10DJ4R7T	RES , CHIP	4.7 OHM	1
R258	CRJ10DJ4R7T	RES , CHIP	4.7 OHM	1
R259	CRJ10DJ4R7T	RES , CHIP	4.7 OHM	1
R260	CRJ10DJ4R7T	RES , CHIP	4.7 OHM	1
R261	CRJ10DJ184T	RES , CHIP	180K OHM	1
R262	CRJ10DJ184T	RES , CHIP	180K OHM	1
R263	CRJ10DJ184T	RES , CHIP	180K OHM	1
R264	CRJ10DJ184T	RES , CHIP	180K OHM	1
R265	CRJ10DJ184T	RES , CHIP	180K OHM	1
R266	CRJ10DJ184T	RES , CHIP	180K OHM	1
R271	CRJ10DJ102T	RES , CHIP	1K OHM	1
R272	CRJ10DJ102T	RES , CHIP	1K OHM	1
R273	CRJ10DJ102T	RES , CHIP	1K OHM	1
R274	CRJ10DJ102T	RES , CHIP	1K OHM	1
R275	CRJ10DJ102T	RES , CHIP	1K OHM	1
R276	CRJ10DJ102T	RES , CHIP	1K OHM	1
R281	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R282	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R283	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R284	CRJ10DJ912T	RES , CHIP	9.1K OHM	1
R285	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R286	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R291	CRJ10DJ184T	RES , CHIP	180K OHM	1
R292	CRJ10DJ184T	RES , CHIP	180K OHM	1
R293	CRJ10DJ184T	RES , CHIP	180K OHM	1
R294	CRJ10DJ184T	RES , CHIP	180K OHM	1
R295	CRJ10DJ184T	RES , CHIP	180K OHM	1
R296	CRJ10DJ184T	RES , CHIP	180K OHM	1
R301	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R302	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R303	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R304	CRJ10DJ332T	RES , CHIP	3.3K OHM	1

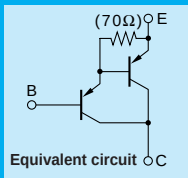
R305	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R306	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R307	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R308	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R309	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R310	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R311	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R312	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R317	CRJ10DJ561T	RES , CHIP	560 OHM	1
R318	CRJ10DF3920	RES. CHIP (392R 1%)	392 OHM	1
R321	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R322	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R323	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R324	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R325	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R326	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R327	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R328	CRJ10DJ103T	RES , CHIP	10K OHM	1
R329	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R330	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R331	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R332	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R341	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R344	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R345	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R348	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R349	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R352	CRJ10DJ122T	RES , CHIP	1.2K OHM	1
R361	CRJ10DJ104T	RES , CHIP	100K OHM	1
R362	CRJ10DJ104T	RES , CHIP	100K OHM	1
R363	CRJ10DJ104T	RES , CHIP	100K OHM	1
R364	CRJ10DJ104T	RES , CHIP	100K OHM	1
R365	CRJ10DJ104T	RES , CHIP	100K OHM	1
R366	CRJ10DJ104T	RES , CHIP	100K OHM	1
R371	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R372	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R373	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R374	CRJ10DJ103T	RES , CHIP	10K OHM	1
R375	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R376	CRJ10DJ512T	RES , CHIP	5.1K OHM	1
R381	CRJ10DJ561T	RES , CHIP	560 OHM	1
R382	CRJ10DJ561T	RES , CHIP	560 OHM	1
R383	CRJ10DJ561T	RES , CHIP	560 OHM	1
R384	CRJ10DJ561T	RES , CHIP	560 OHM	1
R385	CRJ10DJ561T	RES , CHIP	560 OHM	1
R386	CRJ10DJ561T	RES , CHIP	560 OHM	1
R389	CRJ10DJ184T	RES , CHIP	180K OHM	1
R390	CRJ10DJ184T	RES , CHIP	180K OHM	1
R391	CRJ10DF3920	RES. CHIP (392R 1%)	392 OHM	1
R392	CRJ10DF3920	RES. CHIP (392R 1%)	392 OHM	1
R393	CRJ10DF3920	RES. CHIP (392R 1%)	392 OHM	1
R394	CRJ10DF3920	RES. CHIP (392R 1%)	392 OHM	1
R395	CRJ10DF3920	RES. CHIP (392R 1%)	392 OHM	1
R396	CRJ10DF3920	RES. CHIP (392R 1%)	392 OHM	1
R701	CRJ10DJ103T	RES , CHIP	10K OHM	1
R702	CRJ10DJ103T	RES , CHIP	10K OHM	1
R703	CRJ10DJ103T	RES , CHIP	10K OHM	1
R706	CRJ10DJ222T	RES , CHIP	2.2K OHM	1
R707	CRJ10DJ222T	RES , CHIP	2.2K OHM	1
R708	CRJ10DJ101T	RES , CHIP	100K OHM	1
R709	CRJ10DJ103T	RES , CHIP	10K OHM	1
R710	CRJ10DJ103T	RES , CHIP	10K OHM	1
R712	CRJ10DJ103T	RES , CHIP	10K OHM	1
R714	CRJ10DJ104T	RES , CHIP	100K OHM	1
R715	CRJ10DJ104T	RES , CHIP	100K OHM	1
R716	CRJ10DJ472T	RES , CHIP	4.7K OHM	1
R717	CRJ10DJ3R3T	RES , CHIP	3.3 OHM	1
R718	CRJ10DJ123T	RES , CHIP	12K OHM	1
R719	CRJ10DJ473T	RES , CHIP	47K OHM	1
R720	CRJ10DJ473T	RES , CHIP	47K OHM	1

R721	CRJ10DJ330T	RES , CHIP	33 OHM	1
R723	CRJ10DJ2R7T	RES , CHIP	2.7 OHM	1
R724	CRJ10DJ101T	RES , CHIP	100 OHM	1
R725	CRJ10DJ473T	RES , CHIP	47K OHM	1
R726	CRJ10DJ473T	RES , CHIP	47K OHM	1
R727	CRJ10DJ473T	RES , CHIP	47K OHM	1
R728	CRJ10DJ102T	RES , CHIP	1K OHM	1
R729	CRJ10DJ123T	RES , CHIP	12K OHM	1
R730	CRJ10DJ123T	RES , CHIP	12K OHM	1
R732	CRJ10DJ103T	RES , CHIP	10K OHM	1
R737	CRJ10DJ330T	RES , CHIP	33 OHM	1
R739	CRJ10DJ1R0T	RES , CHIP	1 OHM	1
R740	CRJ10DJ820T	RES , CHIP	82 OHM	1
R741	CRJ10DJ330T	RES , CHIP	33 OHM	1
R742	CRJ10DJ330T	RES , CHIP	33 OHM	1
R743	CRJ10DJ330T	RES , CHIP	33 OHM	1
R744	CRJ10DJ0R0T	RES , CHIP	0 OHM	1
R746	CRJ10DJ0R0T	RES , CHIP	0 OHM	1
R747	CRJ10DJ330T	RES , CHIP	33 OHM	1
R748	CRJ10DJ330T	RES , CHIP	33 OHM	1
R751	CRJ10DJ330T	RES , CHIP	33 OHM	1
R752	CRJ10DJ330T	RES , CHIP	33 OHM	1
R753	CRJ10DJ103T	RES , CHIP	10K OHM	1
R754	CRJ10DJ103T	RES , CHIP	10K OHM	1
R756	CRJ10DJ103T	RES , CHIP	10K OHM	1
R759	CRJ10DJ330T	RES , CHIP	33 OHM	1
R760	CRJ10DJ105T	RES , CHIP	1M OHM	1
R765	CRJ10DJ103T	RES , CHIP	10K OHM	1
R766	CRJ10DJ103T	RES , CHIP	10K OHM	1
R767	CRJ10DJ301T	RES , CHIP	300 OHM	1
R768	CRJ10DJ562T	RES , CHIP	5.6K OHM	1
R773	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R774	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R775	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R776	CRJ10DJ332T	RES , CHIP	3.3K OHM	1
R777	CRJ10DJ102T	RES , CHIP	1K OHM	1
R778	CRJ10DJ103T	RES , CHIP	10K OHM	1
R782	CRJ10DJ272T	RES , CHIP	2.7K OHM	1
R783	CRJ10DJ272T	RES , CHIP	2.7K OHM	1
R784	CRJ10DJ473T	RES , CHIP	47K OHM	1
R785	CRJ10DJ104T	RES , CHIP	100K OHM	1
R786	CRJ10DJ471T	RES , CHIP	470 OHM	1
R787	CRJ10DJ103T	RES , CHIP	10K OHM	1
R788	CRJ10DJ103T	RES , CHIP	10K OHM	1
R789	CRJ10DJ103T	RES , CHIP	10K OHM	1
R790	CRJ10DJ103T	RES , CHIP	10K OHM	1
R793	CRJ10DJ103T	RES , CHIP	10K OHM	1
R794	CRJ10DJ102T	RES , CHIP	1K OHM	1
R795	CRJ10DJ102T	RES , CHIP	1K OHM	1
R796	CRJ10DJ102T	RES , CHIP	1K OHM	1
X702	HOX27000E18	CRYSTAL , CHIP(27MHZ,SMD)	27MHZ	1
C261	CCEA1EH470T	CAP , ELECT	47UF 25V	1
C262	CCEA1EH470T	CAP , ELECT	47UF 25V	1
C263	CCEA1EH470T	CAP , ELECT	47UF 25V	1
C264	CCEA1EH470T	CAP , ELECT	47UF 25V	1
C265	CCEA1EH470T	CAP , ELECT	47UF 25V	1
C266	CCEA1EH470T	CAP , ELECT	47UF 25V	1
C267	CCEA1EH470T	CAP , ELECT	47UF 25V	1
C268	CCEA1EH470T	CAP , ELECT	47UF 25V	1
C272	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C273	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C275	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C276	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C281	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C282	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C283	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C284	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C285	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C286	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C292	CCEA1CH101T	CAP , ELECT	100UF 16V	1

C294	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C341	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C342	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C343	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C344	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C345	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C346	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C349	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C358	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C359	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C360	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C371	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C372	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C373	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C374	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C375	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C376	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C389	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C390	CCEA1HH100T	CAP , ELECT	10UF 50V	1
C600	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C602	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C604	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C606	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C608	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C610	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C612	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C614	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C616	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C618	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C620	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C622	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C624	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C626	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C628	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C630	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C703	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C706	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C717	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C720	CCEA1AH471T	CAP , ELECT	470UF 10V	1
C721	CCEA1AH471T	CAP , ELECT	470UF 10V	1
C724	CCEA1AH471T	CAP , ELECT	470UF 10V	1
C726	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C728	CCEA1AH471T	CAP , ELECT	470UF 10V	1
C730	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C736	CCEA1HH2R2T	CAP , ELECT	2.2UF 50V	1
C737	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C740	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C749	CCEA1CH101T	CAP , ELECT	100UF 16V	1
C764	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1
C766	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1
C767	CCEA1CKS100	CAP , ELECT	10UF 16V	1
C774	CCEA1CH101T	CAP , ELECT	100UF 16V	1
D221	CVD1N4003ST	DIODE , RECT	1N4003	1
D222	CVD1N4003ST	DIODE , RECT	1N4003	1
D703	CVD1N4003ST	DIODE , RECT	1N4003	1
D704	CVD1N4003SR	DIODE , RECT	1N4003	1
IC87	HVIRE5VT28C	IC , RESET	RICOH	1
Q301	HVTKTC2874B	T.R , MUTE	KTC2874B	1
Q302	HVTKTC2874B	T.R , MUTE	KTC2874B	1
Q303	HVTKTC2874B	T.R , MUTE	KTC2874B	1
Q304	HVTKTC2874B	T.R , MUTE	KTC2874B	1
Q305	HVTKTC2874B	T.R , MUTE	KTC2874B	1
Q306	HVTKTC2874B	T.R , MUTE	KTC2874B	1
Q311	HVTKTC2874B	T.R , MUTE	KTC2874B	1
BN49	CWB2B905080	WIRE ASS'Y	WIRE	1
CN10	CJP04GB46ZY	WAFER	WAFER	1
CN11	CJP13GA117Z	WAFER , CARD CABLE	WAFER	1
CN12	CJP21GA115Z	WAFER , CARD CABLE	WAFER	1
CN13	CJP13GA115Z	WAFER , CARD CABLE	WAFER	1
CN14	CJP09GA117Z	WAFER	WAFER	1

CN17	CJP12GB142Z	PIN HEADER(12PIN, 2.54mm, ANGLE)	PIN HEADER	1
CN18	CJP05GA19ZY	WAFER, STRAIGHT, 5PIN	WAFER	1
CN19	CJP09GA117Z	WAFER	WAFER	1
CN20	CJP05GA01ZY	WAFER(YMW025-05R)	WAFER	1
CN22	CJP06GA19ZY	WAFER , STRAIGHT DVD LOADER	WAFER	1
CN49	CJP05GA19ZY	WAFER, STRAIGHT, 5PIN	WAFER	1
CN72	CJP17GA117Z	WAFER	WAFER	1
C732	CCEA0JKR322	CAP , ELECT	2200UF 6.3V	1
IC36	HVIL7808CP	I.C , REGULATOR (+8V)		1
IC37	HVINJM7908F	I.C REGULATOR		1
JK11	CJJ4R019W	TERMINAL , IN/OUT	TERMINAL	1
JK12	CJJ4P014W	JACK , IN/OUT	JACK	1
JK13	CJJ4R019W	TERMINAL , IN/OUT	TERMINAL	1
JK14	CJJ4P043W	JACK IN/OUT	JACK	1
X701	HOX24576E15	CRYSTAL	24.576MHZ	1
X703	HOX04332E20	CRYSTAL	4.332MHZ	1

Darlington 2SB1559



Silicon PNP Epitaxial Planar Transistor (Complement to type 2SD2389)

Application : Audio, Series Regulator and General Purpose

Absolute maximum ratings (Ta=25°C)

Symbol	2SB1559	Unit
V_{CBO}	–160	V
V_{CEO}	–150	V
V_{EBO}	–5	V
I_C	–8	A
I_B	–1	A
P_C	80(Tc=25°C)	W
Tj	150	°C
Tstg	–55 to +150	°C

Electrical Characteristics (Ta=25°C)

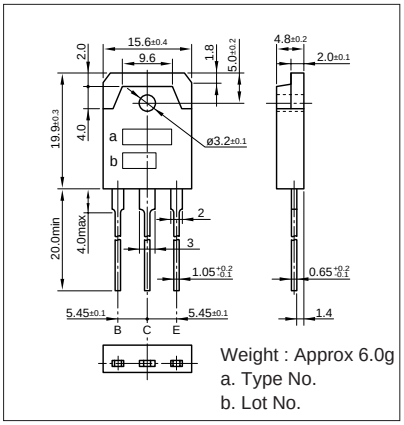
Symbol	Conditions	2SB1559	Unit
I_{CBO}	V_{CB}=–160V	–100max	μA
I_{EBO}	V_{EB}=–5V	–100max	μA
$V_{(BR)CEO}$	I_C=–30mA	–150min	V
h_{FE}	V_{CE}=–4V, I_C=–6A	5000min*	
$V_{CE(sat)}$	I_C=–6A, I_B=–6mA	–2.5max	V
$V_{BE(sat)}$	I_C=–6A, I_B=–6mA	–3.0max	V
f_T	V_{CE}=–12V, I_E=1A	65typ	MHz
C_{OB}	V_{CB}=–10V, f=1MHz	160typ	pF

*h_{FE} Rank O(5000 to 12000), P(6500 to 20000), Y(15000 to 30000)

Typical Switching Characteristics (Common Emitter)

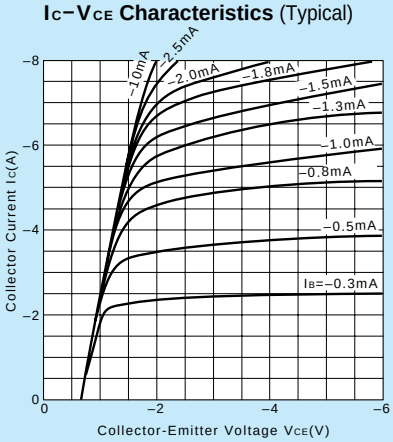
V_{CC} (V)	R_L (Ω)	I_C (A)	V_{BB1} (V)	V_{BB2} (V)	I_{B1} (mA)	I_{B2} (mA)	ton (μs)	tstg (μs)	tf (μs)
–60	10	–6	–10	5	–6	6	0.7typ	3.6typ	0.9typ

External Dimensions MT-100(TO3P)

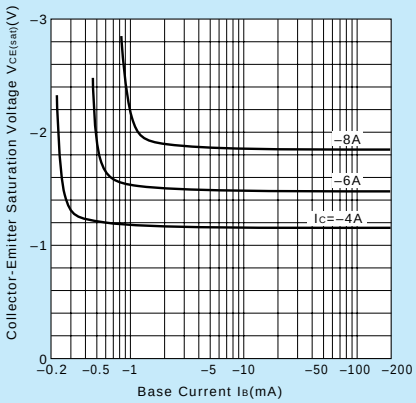


Weight : Approx 6.0g
a. Type No.
b. Lot No.

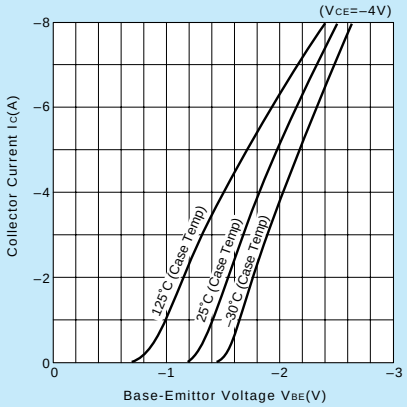
I_C–V_{CE} Characteristics (Typical)



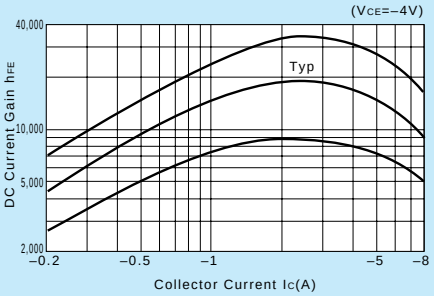
$V_{CE(sat)}$–I_B Characteristics (Typical)



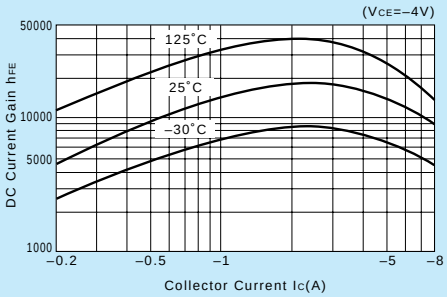
I_C–V_{BE} Temperature Characteristics (Typical)



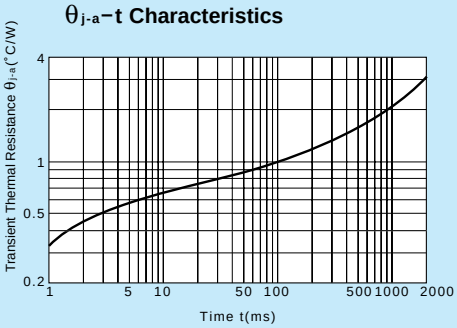
h_{FE}–I_C Characteristics (Typical)



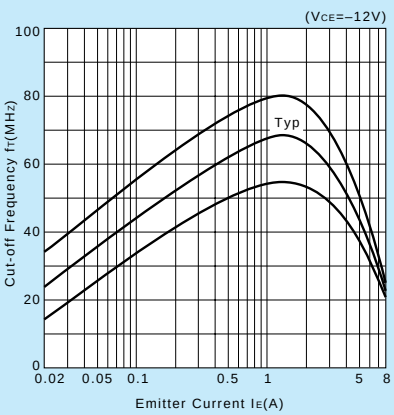
h_{FE}–I_C Temperature Characteristics (Typical)



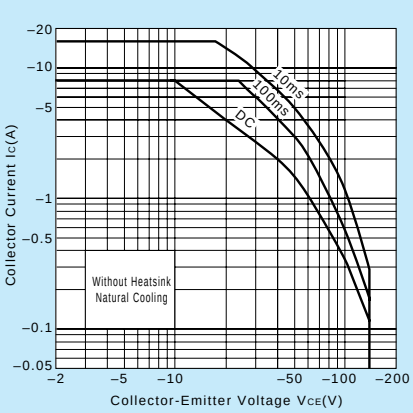
$\theta_{j\text{-}a}$–t Characteristics



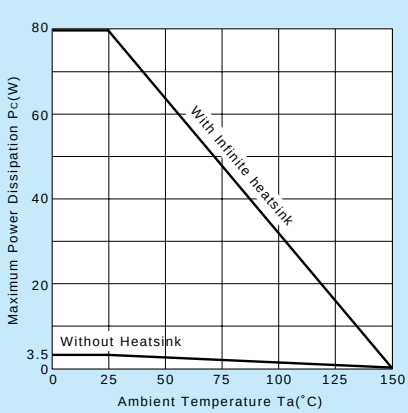
f_T–I_E Characteristics (Typical)



Safe Operating Area (Single Pulse)

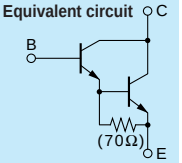


Pc–Ta Derating



Darlington 2SD2389

Equivalent circuit



Silicon NPN Triple Diffused Planar Transistor (Complement to type 2SB1559)

Application : Audio, Series Regulator and General Purpose

Absolute maximum ratings (Ta=25°C)

Symbol	2SD2389	Unit
V_{CBO}	160	V
V_{CEO}	150	V
V_{EBO}	5	V
I_C	8	A
I_B	1	A
P_C	80(Tc=25°C)	W
Tj	150	°C
Tstg	–55 to +150	°C

Electrical Characteristics (Ta=25°C)

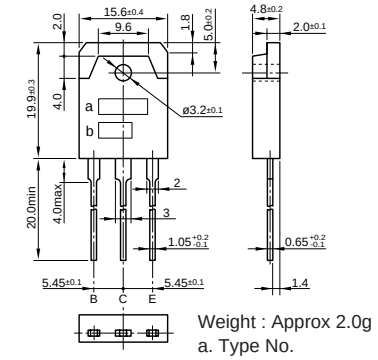
Symbol	Conditions	2SD2389	Unit
I_{CBO}	V_{CB}=160V	100max	μA
I_{EBO}	V_{EB}=5V	100max	μA
$V_{(BR)CEO}$	I_C=30mA	150min	V
h_{FE}	V_{CE}=4V, I_C=6A	5000min*	
$V_{CE(sat)}$	I_C=6A, I_B=6mA	2.5max	V
$V_{BE(sat)}$	I_C=6A, I_B=6mA	3.0max	V
f_T	V_{CE}=12V, I_E=–1A	80typ	MHz
C_{OB}	V_{CB}=10V, f=1MHz	85typ	pF

*h_{FE} Rank O(5000 to 12000), P(6500 to 20000), Y(15000 to 30000)

Typical Switching Characteristics (Common Emitter)

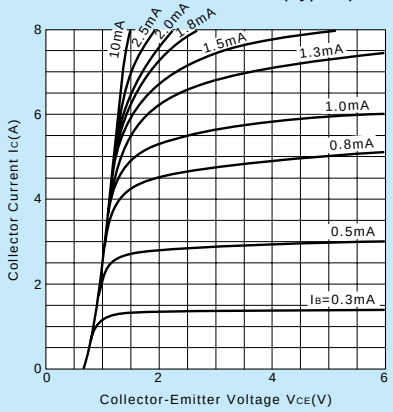
V_{CC} (V)	R_L (Ω)	I_C (A)	V_{BB1} (V)	V_{BB2} (V)	I_{B1} (mA)	I_{B2} (mA)	ton (μs)	tstg (μs)	tf (μs)
60	10	6	10	–5	6	–6	0.6typ	10.0typ	0.9typ

External Dimensions MT-100(TO3P)

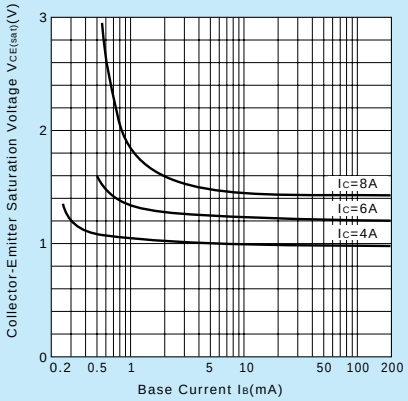


Weight : Approx 2.0g
a. Type No.
b. Lot No.

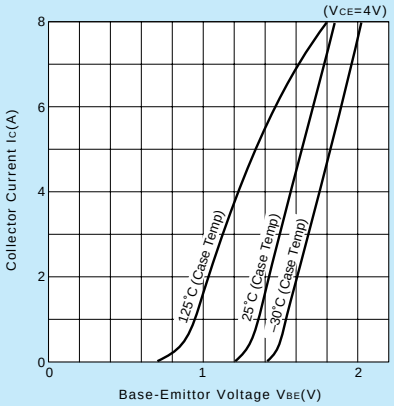
I_C–V_{CE} Characteristics (Typical)



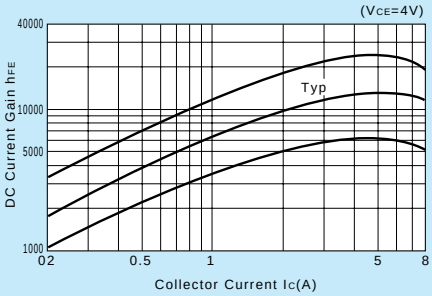
$V_{CE(sat)}$–I_B Characteristics (Typical)



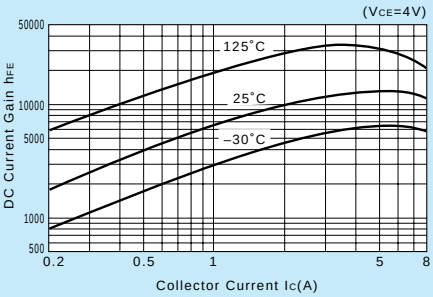
I_C–V_{BE} Temperature Characteristics (Typical)



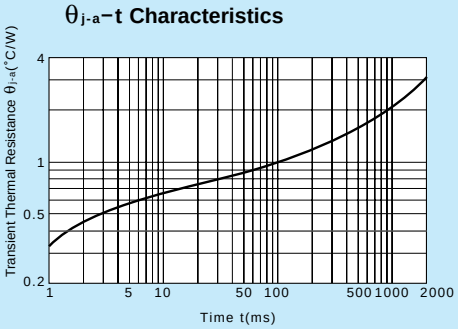
h_{FE}–I_C Characteristics (Typical)



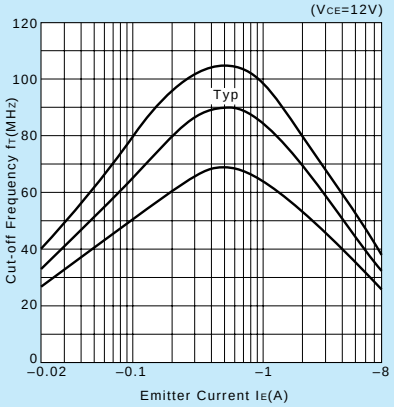
h_{FE}–I_C Temperature Characteristics (Typical)



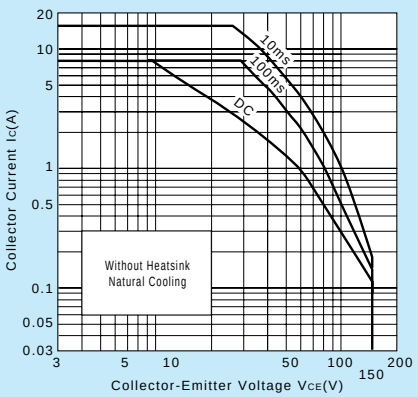
$\theta_{j\text{-}a}$–t Characteristics



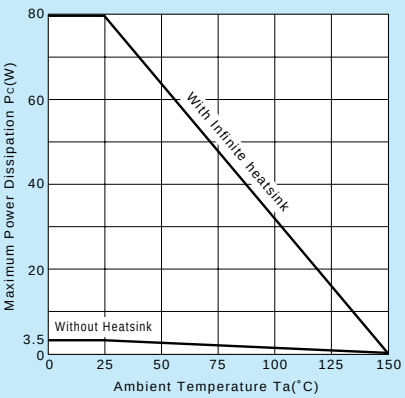
f_T–I_E Characteristics (Typical)



Safe Operating Area (Single Pulse)



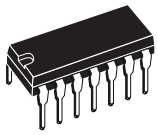
Pc–Ta Derating



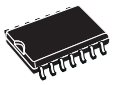
74ACT04

HEX INVERTER

- HIGH SPEED: t_{PD} = 5.0ns (TYP.) at V_{CC} = 5V
- LOW POWER DISSIPATION: I_{CC} = 2µA(MAX.) at T_A=25°C
- COMPATIBLE WITH TTL OUTPUTS V_{IH} = 2V (MIN.), V_{IL} = 0.8V (MAX.)
- 50Ω TRANSMISSION LINE DRIVING CAPABILITY
- SYMMETRICAL OUTPUT IMPEDANCE: $|I_{OH}| = I_{OL}$ = 24mA (MIN)
- BALANCED PROPAGATION DELAYS: $t_{PLH} \cong t_{PHL}$
- OPERATING VOLTAGE RANGE: V_{CC} (OPR) = 4.5V to 5.5V
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 04
- IMPROVED LATCH-UP IMMUNITY



DIP



SOP

TSSOP

ORDER CODES

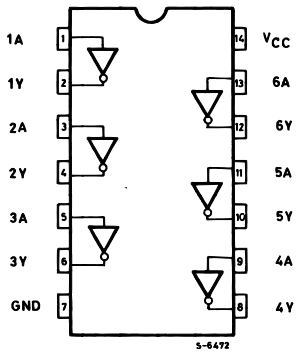
PACKAGE	TUBE	T & R
DIP	74ACT04B	
SOP	74ACT04M	74ACT04MTR
TSSOP		74ACT04TTR

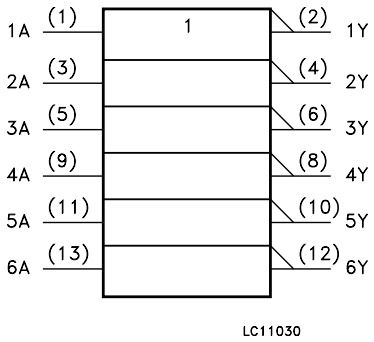
DESCRIPTION

The 74ACT04 is an advanced high-speed CMOS HEX INVERTER fabricated with sub-micron silicon gate and double-layer metal wiring C^2MOS technology.
The internal circuit is composed of 3 stages including buffer output, which enables high noise immunity and stable output.

The device is designed to interface directly High Speed CMOS systems with TTL, NMOS and CMOS output voltage levels.
All inputs and outputs are equipped with protection circuits against static discharge, giving them 2KV ESD immunity and transient excess voltage.

PIN CONNECTION AND IEC LOGIC SYMBOLS

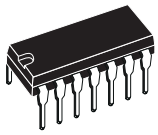




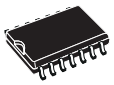
74ACT04

HEX INVERTER

- HIGH SPEED: t_{PD} = 5.0ns (TYP.) at V_{CC} = 5V
- LOW POWER DISSIPATION: I_{CC} = 2µA(MAX.) at T_A=25°C
- COMPATIBLE WITH TTL OUTPUTS V_{IH} = 2V (MIN.), V_{IL} = 0.8V (MAX.)
- 50Ω TRANSMISSION LINE DRIVING CAPABILITY
- SYMMETRICAL OUTPUT IMPEDANCE: $|I_{OH}| = I_{OL}$ = 24mA (MIN)
- BALANCED PROPAGATION DELAYS: $t_{PLH} \cong t_{PHL}$
- OPERATING VOLTAGE RANGE: V_{CC} (OPR) = 4.5V to 5.5V
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 04
- IMPROVED LATCH-UP IMMUNITY



DIP



SOP

TSSOP

ORDER CODES

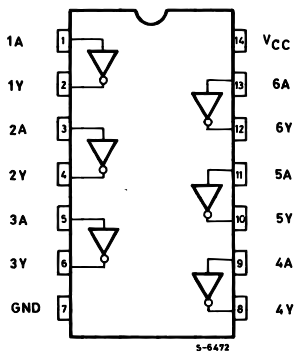
PACKAGE	TUBE	T & R
DIP	74ACT04B	
SOP	74ACT04M	74ACT04MTR
TSSOP		74ACT04TTR

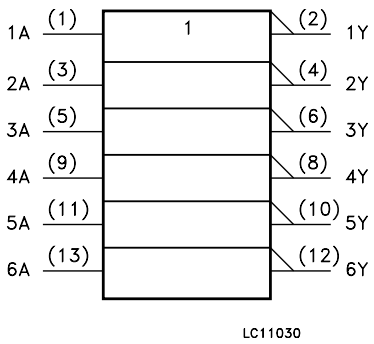
DESCRIPTION

The 74ACT04 is an advanced high-speed CMOS HEX INVERTER fabricated with sub-micron silicon gate and double-layer metal wiring C^2MOS technology.
The internal circuit is composed of 3 stages including buffer output, which enables high noise immunity and stable output.

The device is designed to interface directly High Speed CMOS systems with TTL, NMOS and CMOS output voltage levels.
All inputs and outputs are equipped with protection circuits against static discharge, giving them 2KV ESD immunity and transient excess voltage.

PIN CONNECTION AND IEC LOGIC SYMBOLS





Hex inverter 74HCU04

PIN DESCRIPTION

PIN NO.	SYMBOL	NAME AND FUNCTION
1, 3, 5, 9, 11, 13	1A to 6A	data inputs
2, 4, 6, 8, 10, 12	1Y to 6Y	data outputs
7	GND	ground (0 V)
14	V_{CC}	positive supply voltage

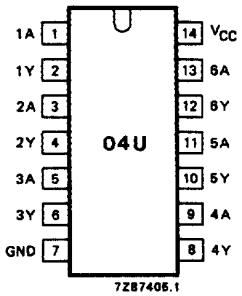


Fig.1 Pin configuration.

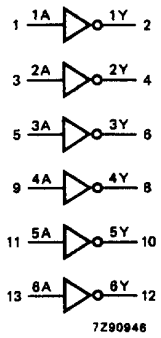


Fig.2 Logic symbol.

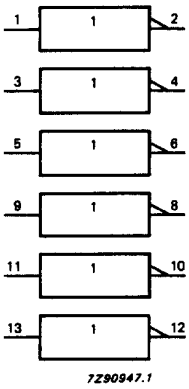


Fig.3 IEC logic symbol.

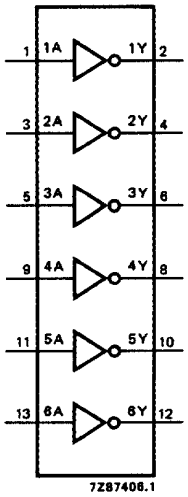


Fig.4 Functional diagram.

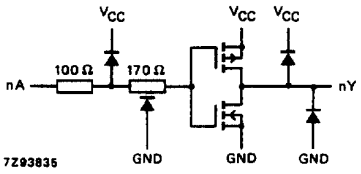
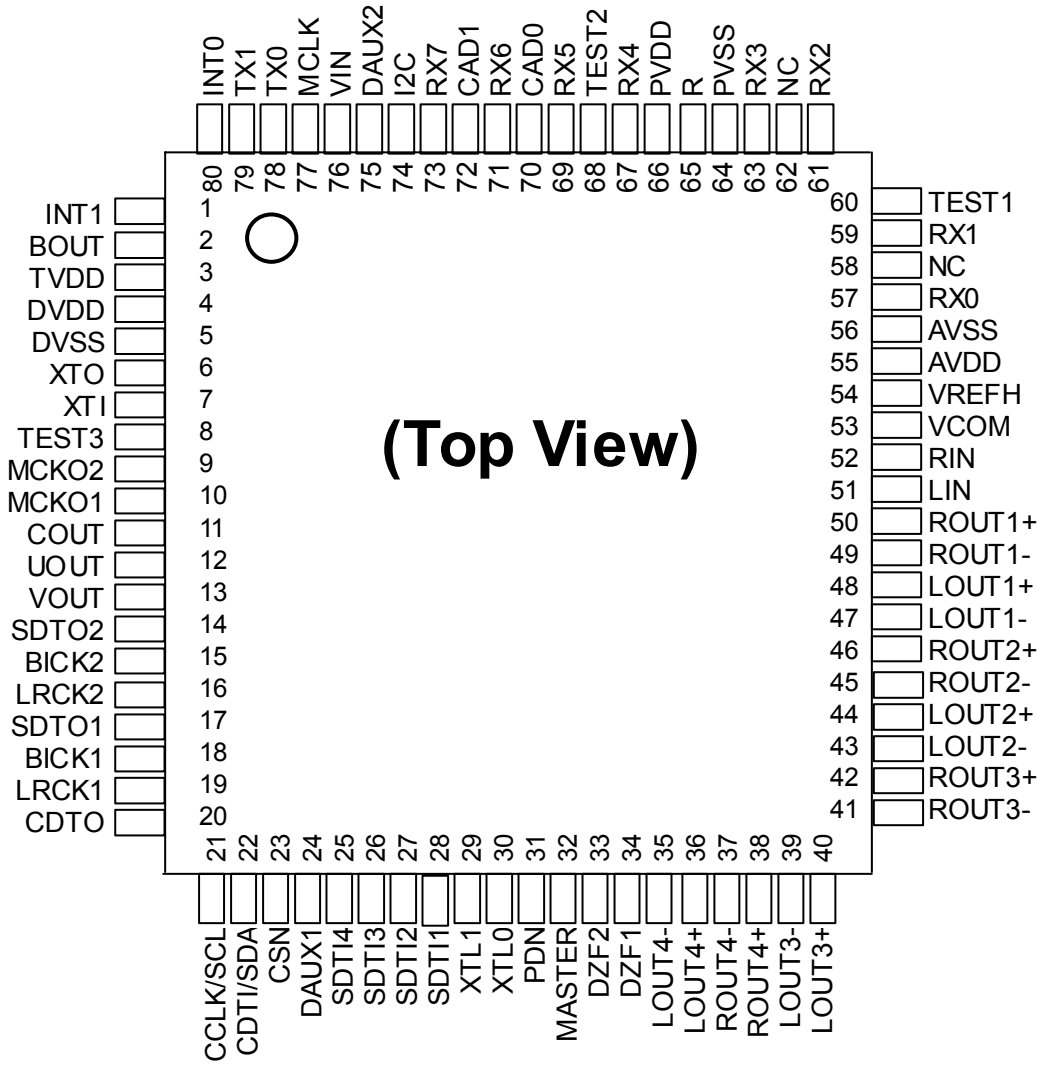


Fig.5 Schematic diagram (one inverter).

■ オーダリングガイド

AK4589VQ	-10 ~ +70°C	80pin LQFP(0.5mm pitch)
AKD4589	評価ボード	

■ ピン配置



7. Package Pinout, 144-Pin QFP/LQFP

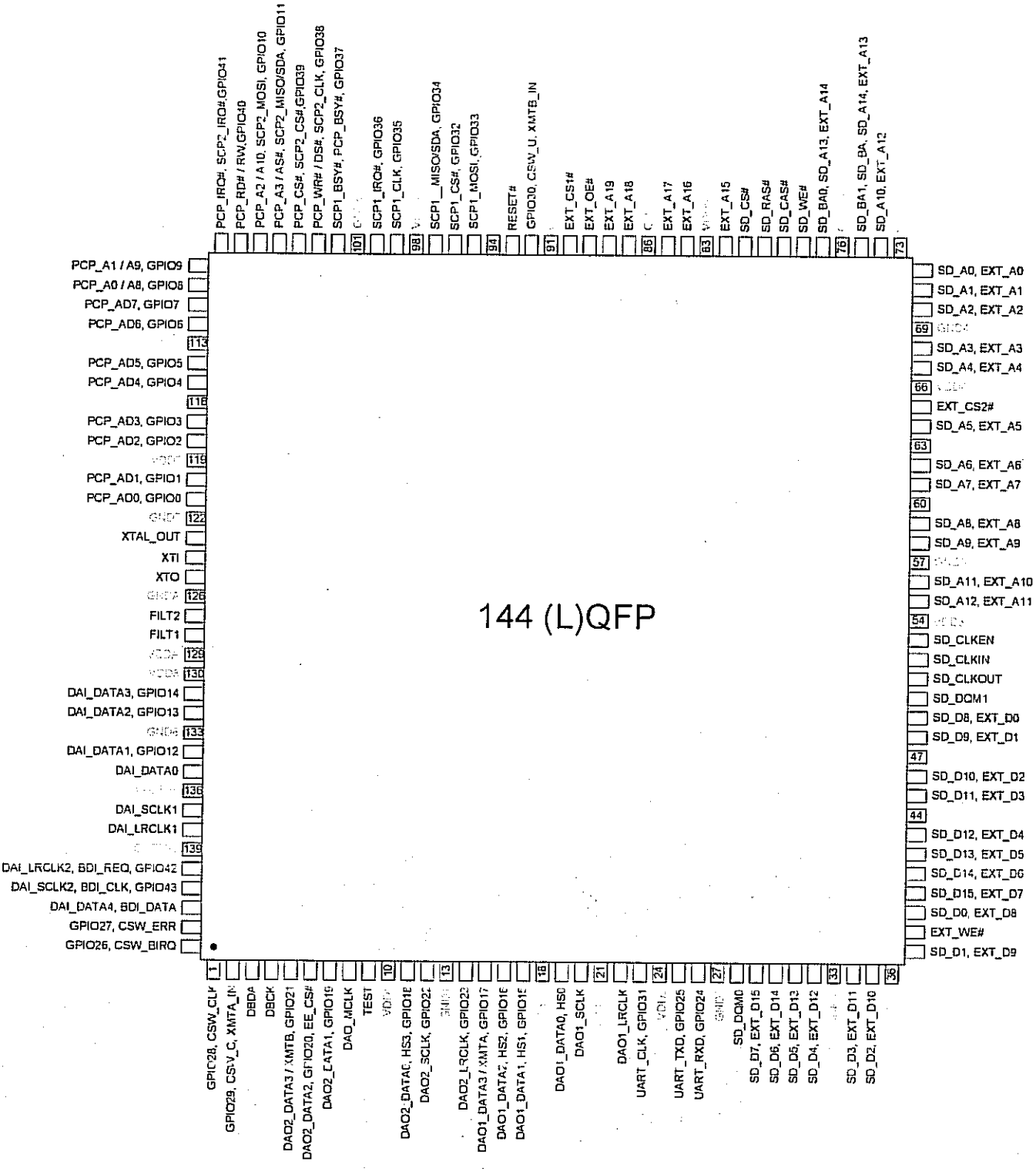
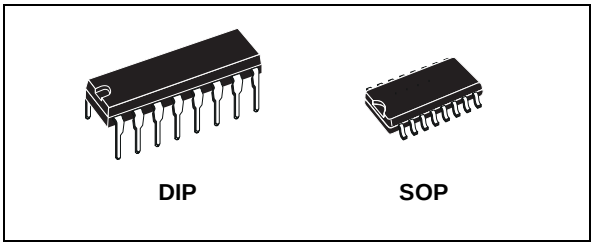


Figure 23. 144-Pin (L)QFP Package Pinout

HCF4053B

TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER

- LOW "ON" RESISTANCE : 125Ω (Typ.) OVER 15V p.p SIGNAL-INPUT RANGE FOR V_{DD} - V_{EE} = 15V
- HIGH "OFF" RESISTANCE : CHANNEL LEAKAGE ± 100pA (Typ.) at V_{DD} - V_{EE} = 18V
- BINARY ADDRESS DECODING ON CHIP
- HIGH DEGREE OF LINEARITY : < 0.5% DISTORTION TYP. at f_{IS} = 1KHz, V_{IS} = 5 V_{pp}, V_{DD} - V_{SS} ≥ 10V, RL = 10KΩ
- VERY LOW QUIESCENT POWER DISSIPATION UNDER ALL DIGITAL CONTROL INPUT AND SUPPLY CONDITIONS : 0.2 μW (Typ.) at V_{DD} - V_{SS} = V_{DD} - V_{EE} =10V
- MATCHED SWITCH CHARACTERISTICS : R_{ON} = 5Ω (Typ.) FOR V_{DD} - V_{EE} = 15V
- WIDE RANGE OF DIGITAL AND ANALOG SIGNAL LEVELS : DIGITAL 3 to 20, ANALOG TO 20V p.p.
- QUIESCENT CURRENT SPECIF. UP TO 20V
- 5V, 10V AND 15V PARAMETRIC RATINGS
- INPUT LEAKAGE CURRENT I_I = 100nA (MAX) AT V_{DD} = 18V T_A = 25°C
- 100% TESTED FOR QUIESCENT CURRENT
- MEETS ALL REQUIREMENTS OF JEDEC JESD13B " STANDARD SPECIFICATIONS FOR DESCRIPTION OF B SERIES CMOS DEVICES"



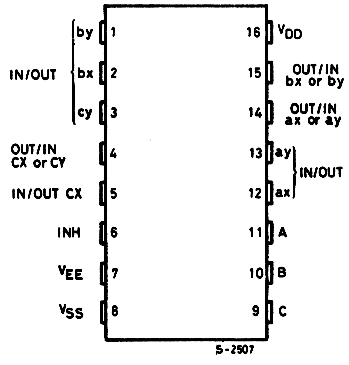
ORDER CODES

PACKAGE	TUBE	T & R
DIP	HCF4053BEY	
SOP	HCF4053BM1	HCF4053M013TR

DESCRIPTION

The HCF4053B is a monolithic integrated circuit fabricated in Metal Oxide Semiconductor technology available in DIP and SOP packages.
The HCF4053B analog multiplexer/demultiplexer is a digitally controlled analog switch having low ON impedance and very low OFF leakage current. This multiplexer circuit dissipate extremely low quiescent power over the full V_{DD} - V_{SS} and V_{DD} - V_{EE} supply voltage range, independent of the logic state of the control signals.
When a logic "1" is present at the inhibit input terminal all channel are off. This device is a triple 2-channel multiplexer having three separate digital control inputs, A, B, and C, and an inhibit input. Each control input selects one of a pair of channels which are connected in a single pole double-throw configuration.

PIN CONNECTION



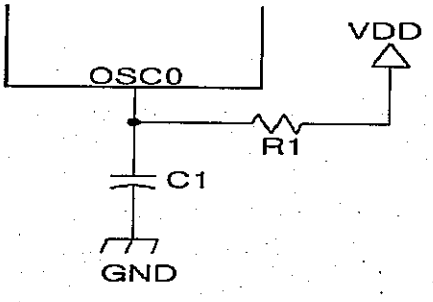
(HCA-18ML03,Rev1,20-Jan-2005)

Pin Description

Pin Name	I/O	Description
F1,F2	-	Filament Voltage pins.
V_{DD}	-	V_{DD} is Power Supply Pin for logic.
D-GND		D-GND is ground Pin for driving CIG-VFD.
L-GND		L-GND is ground Pin for Internal logic.
V_{DISP}		V_{DISP} is Power Supply Pin for driver.
OSC0	I/O	RC oscillator pin.
/RST	I	Reset Input (Built-in Schmidt Trigger) : "Low" initializes all the fuctions.
CS	I	Chip Select Input (Built-in Schmidt Trigger) : Serial data transfer is disabled when CS pin is "H" level.
CP	I	Shift Clock Input (Built-in Schmidt Trigger) : Serial data is shifted on the rising edge of CP
DA	I	Serial Data Input. (Positive logic) : Input from LSB

Oscillation Circuit

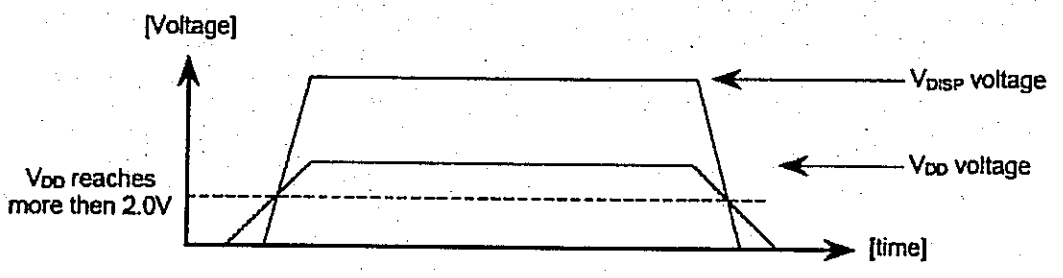
An oscillation circuit may be constructed by connecting external Resistor (R1) and Capacitor (C1) the oscillator pin - OSC0. The RC time constant depends on the value of V_{DD} voltage, R1 and C1 used. The target oscillation frequency is 4.0MHz. Please refer to the diagram below.



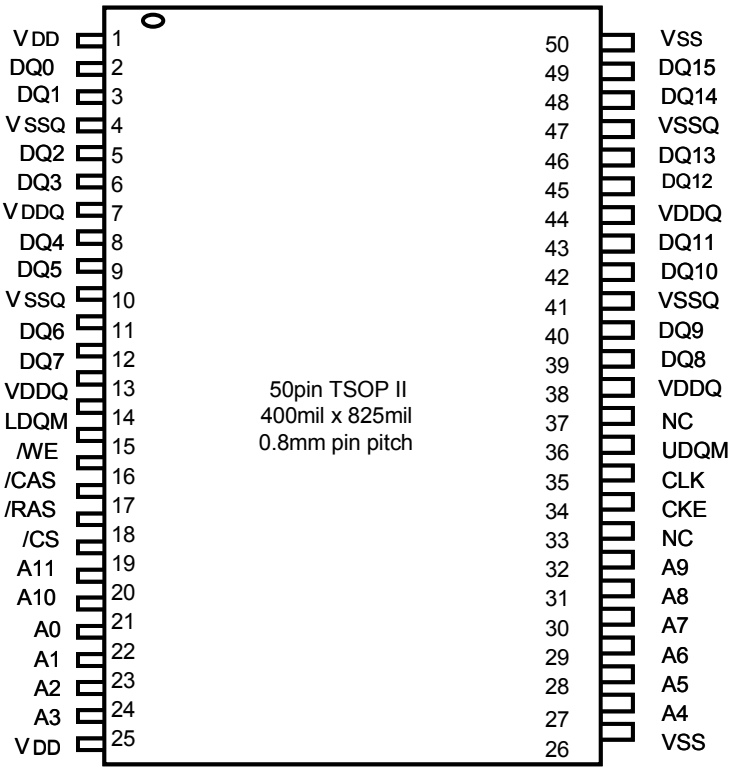
Power Supply Voltage	R1	C1
V_{DD}=5.0	8.2kΩ	39pF

Power sequence

-. To prevent the malfunction, turn on the driver power supply V_{DISP} after the logic power supply V_{DD} is turned on at Power-on sequence. And also, turn off the driver power supply V_{DISP} before the logic power supply V_{DD} is turned off at Power-off sequence.



PIN CONFIGURATION



PIN DESCRIPTION

PIN	PIN NAME	DESCRIPTION
CLK	Clock	The system clock input. All other inputs are referenced to the SDRAM on the rising edge of CLK.
CKE	Clock Enable	Controls internal clock signal and when deactivated, the SDRAM will be one of the states among power down, suspend or self refresh.
$\overline{CS}$	Chip Select	Command input enable or mask except CLK, CKE and DQM
BA	Bank Address	Select either one of banks during both $\overline{RAS}$ and $\overline{CAS}$ activity.
A0 ~ A10	Address	Row Address : RA0 ~ RA10, Column Address : CA0 ~ CA7 Auto-precharge flag : A10
$\overline{RAS}$, $\overline{CAS}$, $\overline{WE}$	Row Address Strobe, Column Address Strobe, Write Enable	$\overline{RAS}$, $\overline{CAS}$ and $\overline{WE}$ define the operation. Refer function truth table for details
LDQM, UDQM	Data Input/Output Mask	DQM control output buffer in read mode and mask input data in write mode
DQ0 ~ DQ15	Data Input/Output	Multiplexed data input / output pin
VDD/VSS	Power Supply/Ground	Power supply for internal circuit and input buffer
VDDQ/VSSQ	Data Output Power/Ground	Power supply for DQ
NC	No Connection	No connection

JGD

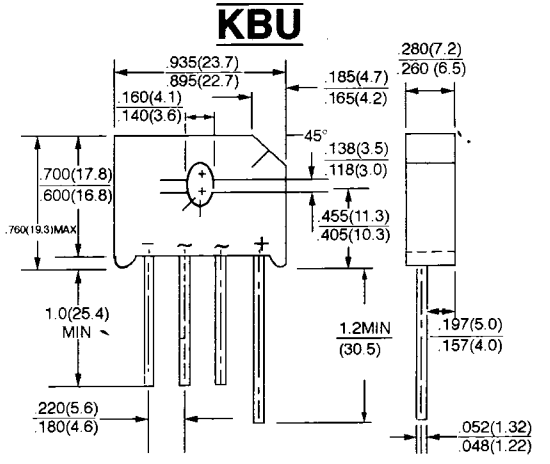
KBU800G THRU KBU810G

SINGLE PHASE 8.0 AMPS. GLASS PASSIVATED BRIDGE RECTIFIERS

FEATURES

* Ideal for printed circuit board
* Reliable low cost construction
* Plastic material has Underwriters Laboratory flammability classification 94V.O
* Surge overloab rating to 200 Amperes peak.

VOLTAGE RANGE
50 to 1000 Volts
CURRENT
8.0 Amperes



Dimensions in inches and (millimeters)

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at 25℃ ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%

TYPE NUMBER	SYMBOLS	KBU 800G	KBU 801G	KBU 802G	KBU 804G	KBU 806G	KBU 808G	KBU 810G	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS Bridge Input Voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum D.C Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum Average Forward Rectified Current @ $T_C = 90℃^{(1)(3)}$ $T_A = 45℃^{(2)}$	$I_{F(AV)}$	8.0							A
Peak Forward Surge Current, 8.3 ms single half sine-wave superimposed on rated load(JEDEC method)	I_{FSM}	175							A
Maximum Forward Voltage Drop per element @ 4.0A	V_F	1.10							V
Maximum Reverse Current at Rated @ $T_A = 25℃$ D.C.Blocking Voltage per element @ $T_A = 100℃$	I_R	10 500							μA μA
Typical thermal resistance per leg (NOTE 2) (NOTE 3)	$R_{\theta JA}$ $R_{\theta JC}$	18 3.0							℃/W
Operating Temperature Range	T_J	−55 to +150							℃
Storage Temperature Range	T_{STG}	−55 to +150							℃

NOTE:
(1) Recommended mounted position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw
(2) Units mounted in free air, no heatsink, P.C.B. 0.375"(9.5mm) lead length with 0.5×0.5" (12×12mm) copper pads
(3) Units mounted on a 3.0×3.0×0.11" (7.5×7.5×0.3cm) Cu. Plate heatsink

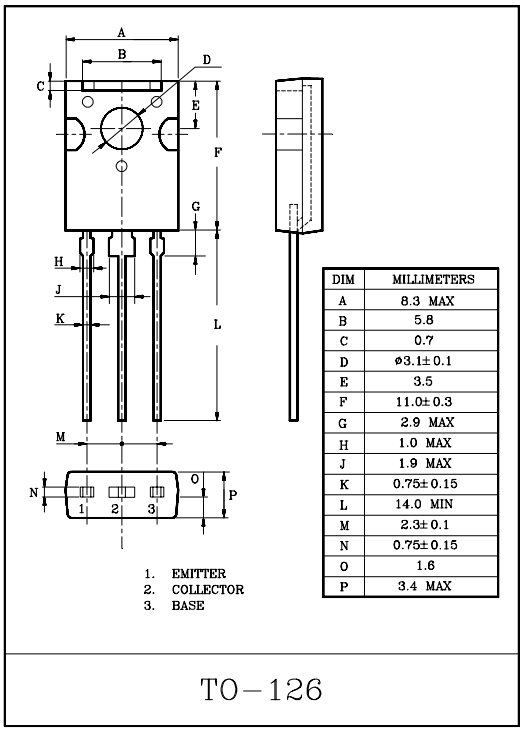
KOREA ELECTRONICS CO.,LTD.

SEMICONDUCTOR
TECHNICAL DATA

KTD600K
EPITAXIAL PLANAR NPN TRANSISTOR

LOW FREQUENCY POWER AMP,
MEDIUM SPEED SWITCHING APPLICATIONS

FEATURES
- High breakdown voltage V_{CEO} 120V, high current 1A.
- Low saturation voltage and good linearity of h_{FE}.



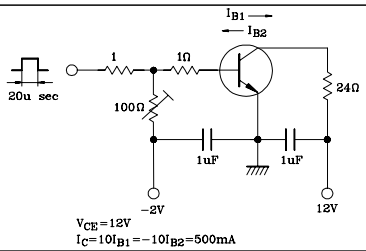
DIM	MILLIMETERS
A	8.3 MAX
B	5.8
C	0.7
D	ø3.1±0.1
E	3.5
F	11.0±0.3
G	2.9 MAX
H	1.0 MAX
J	1.9 MAX
K	0.75±0.15
L	14.0 MIN
M	2.3±0.1
N	0.75±0.15
O	1.6
P	3.4 MAX

TO-126

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	120	V
Collector-Emitter Voltage		V_{CEO}	120	V
Emitter-Base Voltage		V_{EBO}	5	V
Collector Current		I_C	1	A
		I_{CP}	2	
Collector Power Dissipation	Ta=25℃	P_C	1.5	W
	Tc=25℃		8	
Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55~150	℃

ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut of Current		I_{CBO}	V_{CB}=50V, I_E=0	-	-	1	μA
Emitter Cut of Current		I_{EBO}	V_{EB}=4V, I_C=0	-	-	1	μA
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	I_C=10μA	120	-	-	V
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	I_C=1mA	120	-	-	V
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$	I_E=10μA	5	-	-	V
DC Current Gain		h_{FE}(1)Note	V_{CE}=5V, I_C=50mA	100	-	320	
		h_{FE}(2)	V_{CE}=5V, I_C=500mA	20	-	-	
Gain Bandwidth Product		f_T	V_{CE}=10V, I_C=50mA	-	130	-	MHz
Output Capacitance		C_{ob}	V_{CB}=10V, f=1MHz	-	20	-	pF
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C=500mA, I_B=50mA	-	0.15	0.4	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$	I_C=500mA, I_B=50mA	-	0.85	1.2	V
Switching Time	Turn-on Time	t_{on}		-	100	-	nS
	Turn-off Time	t_{off}		-	500	-	
	Storage Time	t_{stg}		-	700	-	

(Note) : h_{FE}(1) Classification Y:100~200, GR:160~320

Figure 3: Connection Diagram (top view)

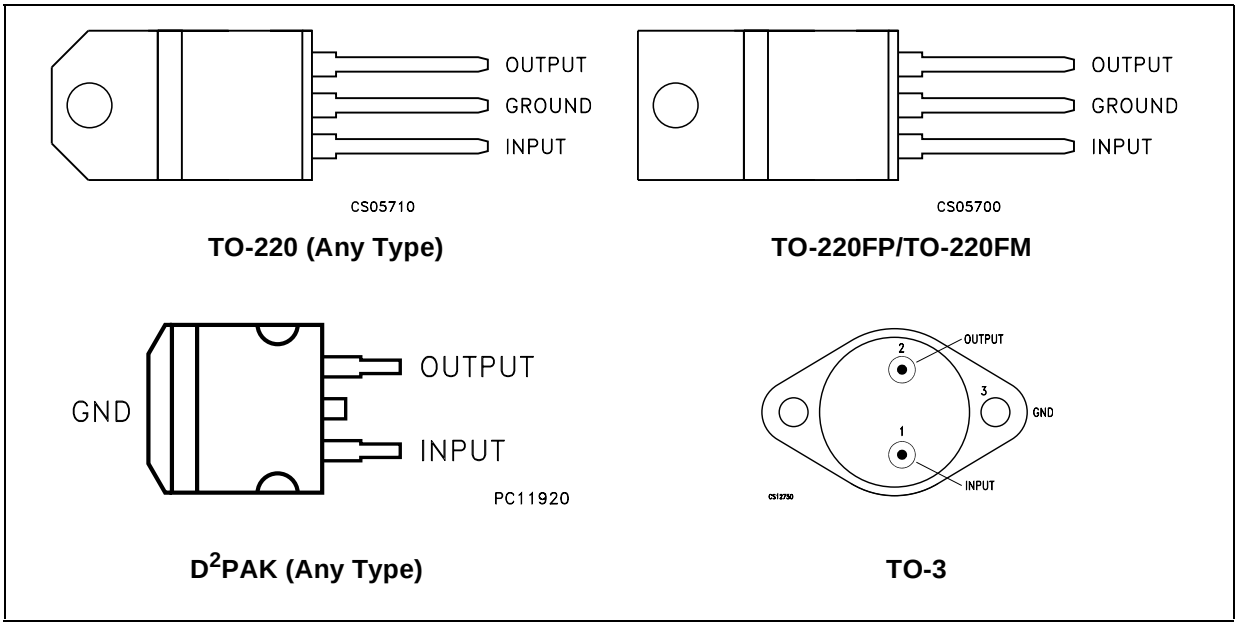
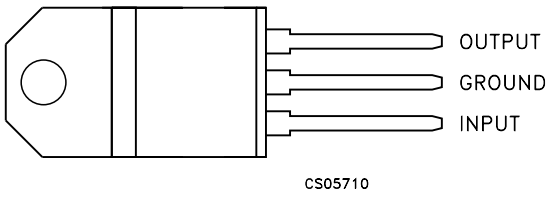


Table 3: Order Codes

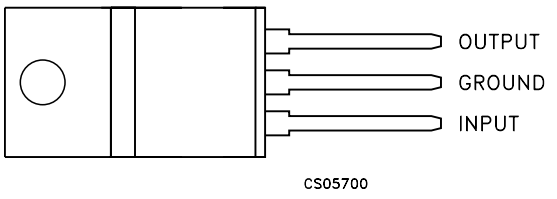
TYPE	TO-220 (A Type)	TO-220 (C Type)	TO-220 (E Type)	D²PAK (A Type) (*)	D²PAK (C Type) (T & R)	TO-220FP	TO-220FM	TO-3
L7805								L7805T
L7805C	L7805CV	L7805C-V	L7805CV1	L7805CD2T	L7805C-D2TR	L7805CP	L7805CF	L7805CT
L7852C	L7852CV			L7852CD2T		L7852CP	L7852CF	L7852CT
L7806								L7806T
L7806C	L7806CV	L7806C-V		L7806CD2T		L7806CP	L7806CF	L7806CT
L7808								L7808T
L7808C	L7808CV	L7808C-V		L7808CD2T		L7808CP	L7808CF	L7808CT
L7885C	L7885CV			L7885CD2T		L7885CP	L7885CF	L7885CT
L7809C	L7809CV	L7809C-V		L7809CD2T		L7809CP	L7809CF	L7809CT
L7810C	L7810CV			L7810CD2T		L7810CP		
L7812								L7812T
L7812C	L7812CV	L7812C-V		L7812CD2T		L7812CP	L7812CF	L7812CT
L7815								L7815T
L7815C	L7815CV	L7815C-V		L7815CD2T		L7815CP	L7815CF	L7815CT
L7818								L7818T
L7818C	L7818CV			L7818CD2T		L7818CP	L7818CF	L7818CT
L7820								L7820T
L7820C	L7820CV			L7820CD2T		L7820CP	L7820CF	L7820CT
L7824								L7824T
L7824C	L7824CV			L7824CD2T		L7824CP	L7824CF	L7824CT

(*) Available in Tape & Reel with the suffix "-TR".

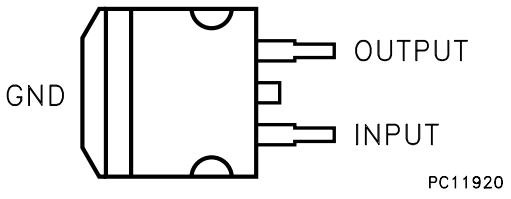
Figure 3: Connection Diagram (top view)



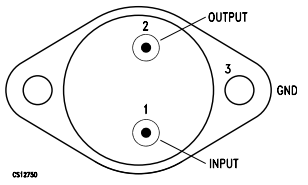
TO-220 (Any Type)



TO-220FP/TO-220FM



D²PAK (Any Type)



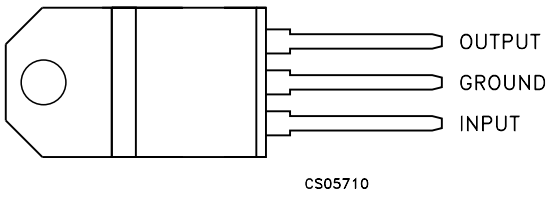
TO-3

Table 3: Order Codes

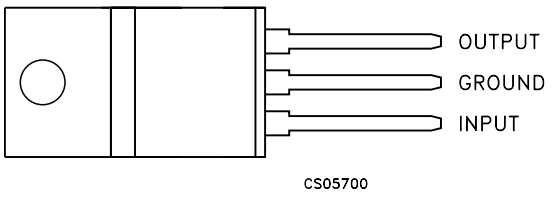
TYPE	TO-220 (A Type)	TO-220 (C Type)	TO-220 (E Type)	D²PAK (A Type) (*)	D²PAK (C Type) (T & R)	TO-220FP	TO-220FM	TO-3
L7805								L7805T
L7805C	L7805CV	L7805C-V	L7805CV1	L7805CD2T	L7805C-D2TR	L7805CP	L7805CF	L7805CT
L7852C	L7852CV			L7852CD2T		L7852CP	L7852CF	L7852CT
L7806								L7806T
L7806C	L7806CV	L7806C-V		L7806CD2T		L7806CP	L7806CF	L7806CT
L7808								L7808T
L7808C	L7808CV	L7808C-V		L7808CD2T		L7808CP	L7808CF	L7808CT
L7885C	L7885CV			L7885CD2T		L7885CP	L7885CF	L7885CT
L7809C	L7809CV	L7809C-V		L7809CD2T		L7809CP	L7809CF	L7809CT
L7810C	L7810CV			L7810CD2T		L7810CP		
L7812								L7812T
L7812C	L7812CV	L7812C-V		L7812CD2T		L7812CP	L7812CF	L7812CT
L7815								L7815T
L7815C	L7815CV	L7815C-V		L7815CD2T		L7815CP	L7815CF	L7815CT
L7818								L7818T
L7818C	L7818CV			L7818CD2T		L7818CP	L7818CF	L7818CT
L7820								L7820T
L7820C	L7820CV			L7820CD2T		L7820CP	L7820CF	L7820CT
L7824								L7824T
L7824C	L7824CV			L7824CD2T		L7824CP	L7824CF	L7824CT

(*) Available in Tape & Reel with the suffix "-TR".

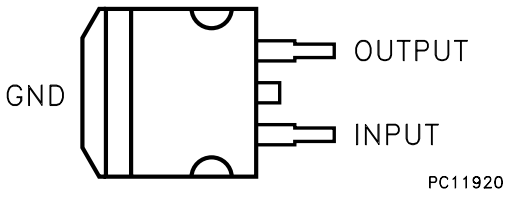
Figure 3: Connection Diagram (top view)



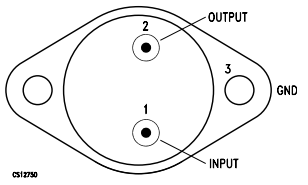
TO-220 (Any Type)



TO-220FP/TO-220FM



D^2PAK (Any Type)



TO-3

Table 3: Order Codes

TYPE	TO-220 (A Type)	TO-220 (C Type)	TO-220 (E Type)	D^2PAK (A Type) (*)	D^2PAK (C Type) (T & R)	TO-220FP	TO-220FM	TO-3
L7805								L7805T
L7805C	L7805CV	L7805C-V	L7805CV1	L7805CD2T	L7805C-D2TR	L7805CP	L7805CF	L7805CT
L7852C	L7852CV			L7852CD2T		L7852CP	L7852CF	L7852CT
L7806								L7806T
L7806C	L7806CV	L7806C-V		L7806CD2T		L7806CP	L7806CF	L7806CT
L7808								L7808T
L7808C	L7808CV	L7808C-V		L7808CD2T		L7808CP	L7808CF	L7808CT
L7885C	L7885CV			L7885CD2T		L7885CP	L7885CF	L7885CT
L7809C	L7809CV	L7809C-V		L7809CD2T		L7809CP	L7809CF	L7809CT
L7810C	L7810CV			L7810CD2T		L7810CP		
L7812								L7812T
L7812C	L7812CV	L7812C-V		L7812CD2T		L7812CP	L7812CF	L7812CT
L7815								L7815T
L7815C	L7815CV	L7815C-V		L7815CD2T		L7815CP	L7815CF	L7815CT
L7818								L7818T
L7818C	L7818CV			L7818CD2T		L7818CP	L7818CF	L7818CT
L7820								L7820T
L7820C	L7820CV			L7820CD2T		L7820CP	L7820CF	L7820CT
L7824								L7824T
L7824C	L7824CV			L7824CD2T		L7824CP	L7824CF	L7824CT

(*) Available in Tape & Reel with the suffix "-TR".

L7900

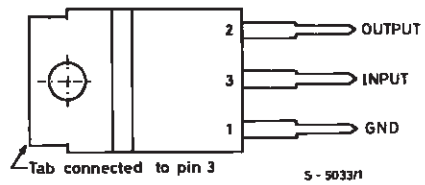
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_i	DC Input Voltage (for V_O = 5 to 18V) (for V_O = 20, 24V)	-35 -40	V V
I_o	Output Current	Internally limited	
P_{tot}	Power Dissipation	Internally limited	
T_{op}	Operating Junction Temperature Range	0 to 150	°C
T_{stg}	Storage Temperature Range	- 65 to 150	°C

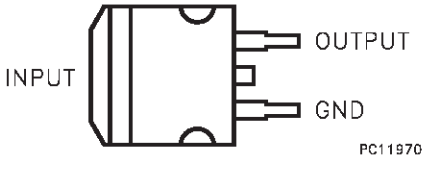
THERMAL DATA

Symbol	Parameter		D^2PAK	TO-220	ISOWATT220	TO-3	Unit
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	3	3	4	4	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	62.5	50	60	35	°C/W

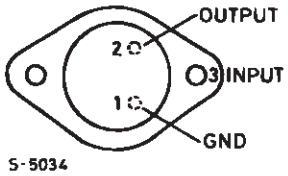
CONNECTION DIAGRAM AND ORDERING NUMBERS (top view)



TO-220 & ISOWATT220



D^2PAK

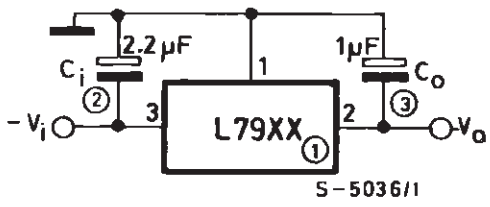


TO-3

Type	TO-220	D^2PAK (*)	ISOWATT220	TO-3	Output Voltage
L7905C	L7905CV	L7905CD2T	L7905CP	L7905CT	-5V
L7952C	L7952CV	L7952CD2T		L7952CT	-5.2V
L7906C	L7906CV	L7906CD2T	L7906CP	L7906CT	-6V
L7908C	L7908CV	L7908CD2T	L7908CP	L7908CT	-8V
L7912C	L7912CV	L7912CD2T	L7912CP	L7912CT	-12V
L7915C	L7915CV	L7915CD2T	L7915CP	L7915CT	-15V
L7918C	L7918CV	L7918CD2T	L7918CP	L7918CT	-18V
L7920C	L7920CV	L7920CD2T	L7920CP	L7920CT	-20V
L7922C	L7922CV	L7922CD2T		L7922CT	-22V
L7924C	L7924CV	L7924CD2T	L7924CP	L7924CT	-24V

(*) AVAILABLE IN TAPE AND REEL WITH "-TR" SUFFIX

APPLICATION CIRCUIT



L7900

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_i	DC Input Voltage (for V_O = 5 to 18V) (for V_O = 20, 24V)	-35 -40	V V
I_o	Output Current	Internally limited	
P_{tot}	Power Dissipation	Internally limited	
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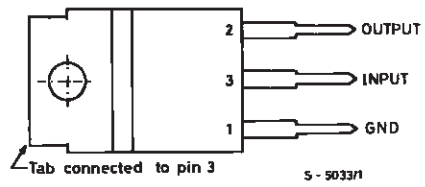
T_{stg}	Storage Temperature Range	- 65 to 150	°C

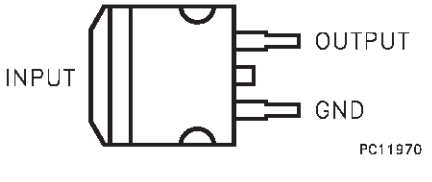
THERMAL DATA

Symbol	Parameter		D^2PAK	TO-220	ISOWATT220	TO-3	Unit
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	3	3	4	4	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	62.5	50	60	35	°C/W

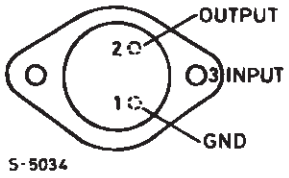
CONNECTION DIAGRAM AND ORDERING NUMBERS (top view)



TO-220 & ISOWATT220



D^2PAK

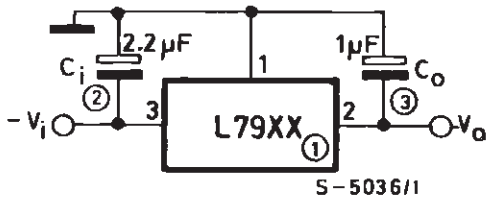


TO-3

Type	TO-220	D^2PAK (*)	ISOWATT220	TO-3	Output Voltage
L7905C	L7905CV	L7905CD2T	L7905CP	L7905CT	-5V
L7952C	L7952CV	L7952CD2T		L7952CT	-5.2V
L7906C	L7906CV	L7906CD2T	L7906CP	L7906CT	-6V
L7908C	L7908CV	L7908CD2T	L7908CP	L7908CT	-8V
L7912C	L7912CV	L7912CD2T	L7912CP	L7912CT	-12V
L7915C	L7915CV	L7915CD2T	L7915CP	L7915CT	-15V
L7918C	L7918CV	L7918CD2T	L7918CP	L7918CT	-18V
L7920C	L7920CV	L7920CD2T	L7920CP	L7920CT	-20V
L7922C	L7922CV	L7922CD2T		L7922CT	-22V
L7924C	L7924CV	L7924CD2T	L7924CP	L7924CT	-24V

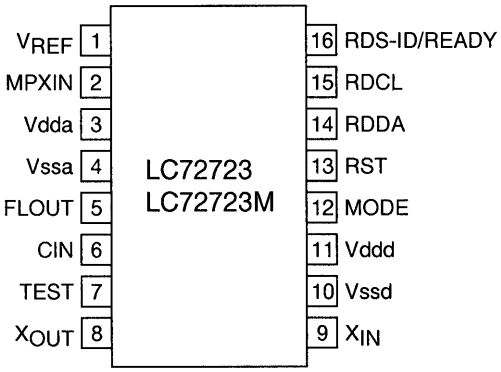
(*) AVAILABLE IN TAPE AND REEL WITH "-TR" SUFFIX

APPLICATION CIRCUIT

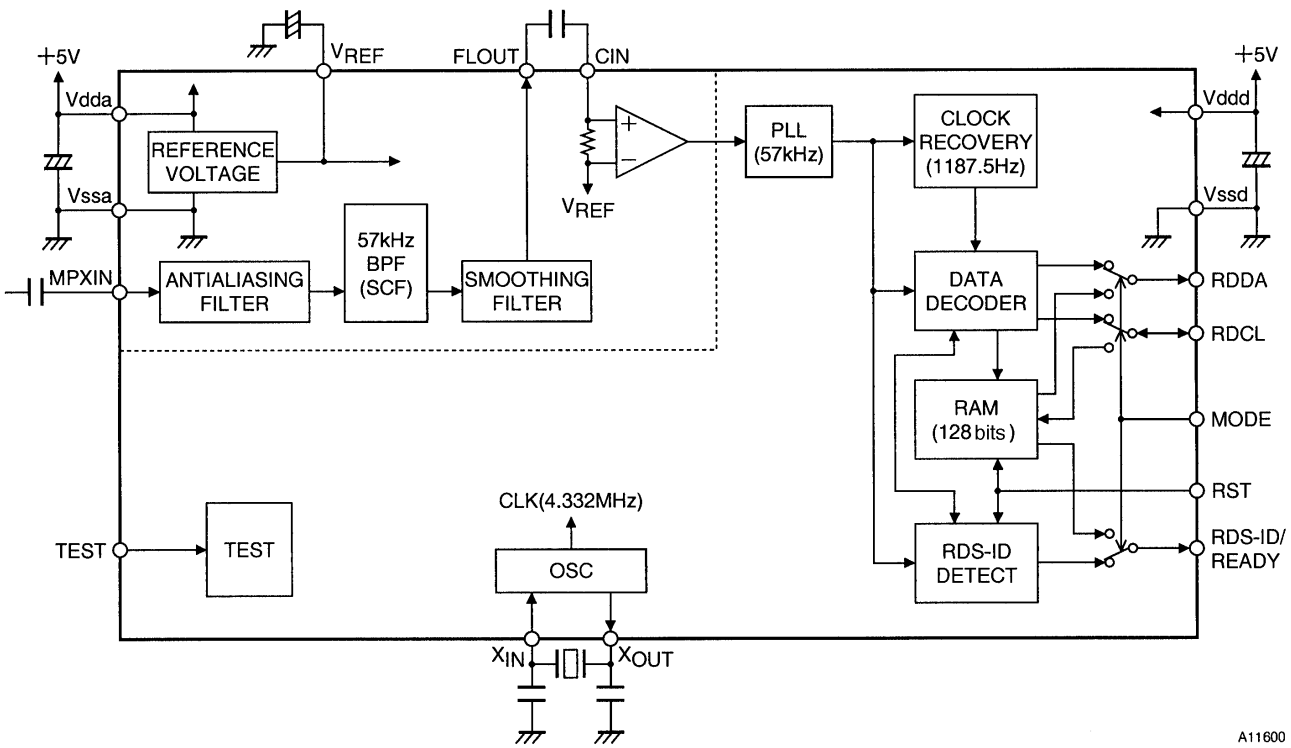


LC72723, LC72723M

Pin Assignment (DIP16/MFP16)



Block Diagram

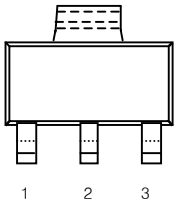


1A LOWDROP OUT VOLTAGE REGULATOR (ADJUSTABLE & FIXED) LM1117

FEATURES

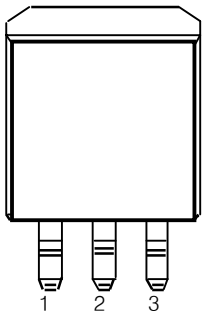
- Output Current up to 1 A
- Low Dropout Voltage (700mV at 1A Output Current)
- Three Terminal Adjustable or Fixed 1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, 5.0V
- 2.85V Device for SCSI-II Active Terminator
- 0.04% Line Regulaion, 0.1% Load Regulation
- Very Low Quiescent Current
- Internal Current andTerminal Limit
- Logic-Controlled Electronics Shutdown
- Surface Mount Package SOT-223 & TO-263 (D2-Pack)
- 100% Thermal Limit Burn-In

SOT-223 PKG (FRONT VIEW)



PIN FUNCTION
1. Adj/Gnd
2. Vout
3. Vin

TO-263 (D2 PKG, FRONT VIEW)



PIN FUNCTION
1. Adj/Gnd
2. Vout
3. Vin

APPLICATION

- Active SCSI Terminators
- Portable/Plan Top/Notebook Computers
- High Efficiency Linear Regulators
- SMPS Post Regulators
- Mother B/D Clock Supplies
- Disk Drives
- Battery Chargers

ORDERING INFORMATION

Device (Marking)	Package
LM1117S	SOT-223
LM1117S-XX	
LM1117T	TO-263 (D2)
LM1117T-XX	

(X=Output Voltage=1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, 5.0V, Adjustable=AD)

DESCRIPTION

The LM1117 is a low power positive-voltage regulator designed to meet 1A output current and comply with SCSI-II specifications with a fixed output voltage of 2.85V. This device is an excellent choice for use in battery-powered applications, as active terminators for the SCSI bus, and portable computers.
The LM1117 features very low quiescent current and very low dropout voltage of 700mV at a full load and lower as output current decreases. LM1117 is available as an adjustable or fixed 1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, and 5.0V output voltages.
The LM1117 is offered in a 3-pin surface mount package SOT-223 & TO-263. The output capacitor of 10μF or larger is needed for output stability of LM1117 as required by most of the other regulator circuits.

ABSOLUTE MAXIMUM RATINGS

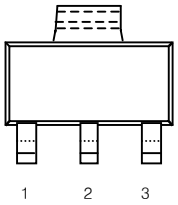
CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
DC Input Voltage	V_{IN}		7	V
Lead Temperature (Soldering, 5 Seconds)	T_{SOL}		260	℃
Storage Temperature Range	T_{STG}	-65	150	℃
Operating Junction Temperature Range	T_{OPR}	0	125	℃

1A LOWDROP OUT VOLTAGE REGULATOR (ADJUSTABLE & FIXED) LM1117

FEATURES

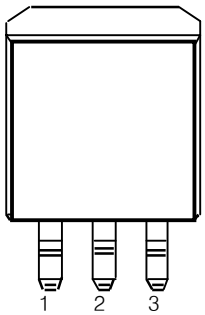
- Output Current up to 1 A
- Low Dropout Voltage (700mV at 1A Output Current)
- Three Terminal Adjustable or Fixed 1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, 5.0V
- 2.85V Device for SCSI-II Active Terminator
- 0.04% Line Regulaion, 0.1% Load Regulation
- Very Low Quiescent Current
- Internal Current andTerminal Limit
- Logic-Controlled Electronics Shutdown
- Surface Mount Package SOT-223 & TO-263 (D2-Pack)
- 100% Thermal Limit Burn-In

SOT-223 PKG (FRONT VIEW)



PIN FUNCTION
1. Adj/Gnd
2. Vout
3. Vin

TO-263 (D2 PKG, FRONT VIEW)



PIN FUNCTION
1. Adj/Gnd
2. Vout
3. Vin

APPLICATION

- Active SCSI Terminators
- Portable/Plan Top/Notebook Computers
- High Efficiency Linear Regulators
- SMPS Post Regulators
- Mother B/D Clock Supplies
- Disk Drives
- Battery Chargers

ORDERING INFORMATION

Device (Marking)	Package
LM1117S	SOT-223
LM1117S-XX	
LM1117T	TO-263 (D2)
LM1117T-XX	

(X=Output Voltage=1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, 5.0V, Adjustable=AD)

DESCRIPTION

The LM1117 is a low power positive-voltage regulator designed to meet 1A output current and comply with SCSI-II specifications with a fixed output voltage of 2.85V. This device is an excellent choice for use in battery-powered applications, as active terminators for the SCSI bus, and portable computers.
The LM1117 features very low quiescent current and very low dropout voltage of 700mV at a full load and lower as output current decreases. LM1117 is available as an adjustable or fixed 1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, and 5.0V output voltages.
The LM1117 is offered in a 3-pin surface mount package SOT-223 & TO-263. The output capacitor of 10μF or larger is needed for output stability of LM1117 as required by most of the other regulator circuits.

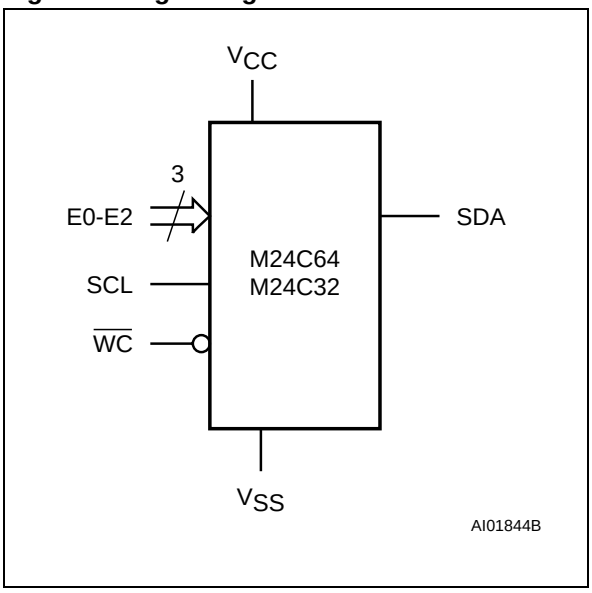
ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
DC Input Voltage	V_{IN}		7	V
Lead Temperature (Soldering, 5 Seconds)	T_{SOL}		260	℃
Storage Temperature Range	T_{STG}	-65	150	℃
Operating Junction Temperature Range	T_{OPR}	0	125	℃

SUMMARY DESCRIPTION

These I^2C-compatible electrically erasable programmable memory (EEPROM) devices are organized as 8192 x 8 bits (M24C64) and 4096 x 8 bits (M24C32).

Figure 2. Logic Diagram



I^2C uses a two-wire serial interface, comprising a bi-directional data line and a clock line. The devices carry a built-in 4-bit Device Type Identifier code (1010) in accordance with the I^2C bus definition.

The device behaves as a slave in the I^2C protocol, with all memory operations synchronized by the serial clock. Read and Write operations are initiated by a Start condition, generated by the bus master. The Start condition is followed by a Device Select Code and Read/Write bit (RW) (as described in Table 3.), terminated by an acknowledge bit.

When writing data to the memory, the device inserts an acknowledge bit during the 9th bit time, following the bus master's 8-bit transmission. When data is read by the bus master, the bus master acknowledges the receipt of the data byte in the same way. Data transfers are terminated by a Stop condition after an Ack for Write, and after a NoAck for Read.

Table 2. Signal Names

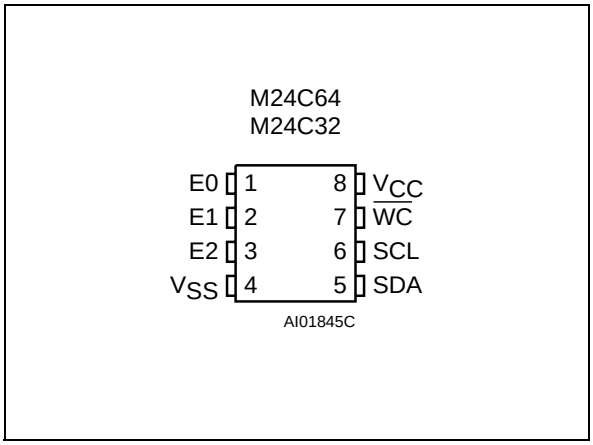
E0, E1, E2	Chip Enable
SDA	Serial Data
SCL	Serial Clock
$\overline{WC}$	Write Control
V_{CC}	Supply Voltage
V_{SS}	Ground

Power On Reset: V_{CC} Lock-Out Write Protect

In order to prevent data corruption and inadvertent Write operations during Power-up, a Power On Reset (POR) circuit is included. At Power-up, the internal reset is held active until V_{CC} has reached the Power On Reset (POR) threshold voltage, and all operations are disabled – the device will not respond to any command. In the same way, when V_{CC} drops from the operating voltage, below the Power On Reset (POR) threshold voltage, all operations are disabled and the device will not respond to any command.

A stable and valid V_{CC} (as defined in Table 9. and Table 10.) must be applied before applying any logic signal.

Figure 3. DIP, SO, TSSOP and UFDFPN Connections



Note: See PACKAGE MECHANICAL section for package dimensions, and how to identify pin-1.

Figure 3. SO Connections

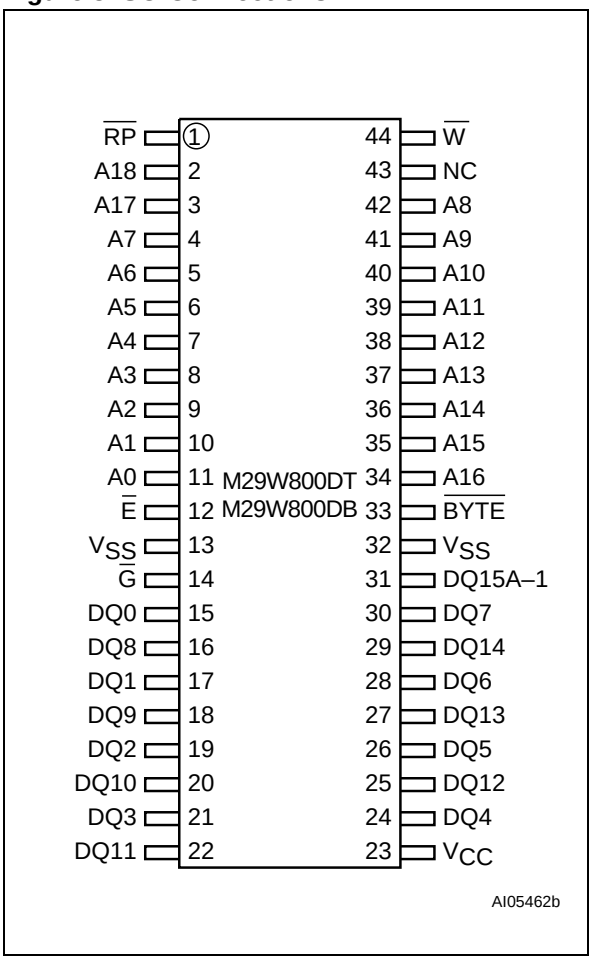
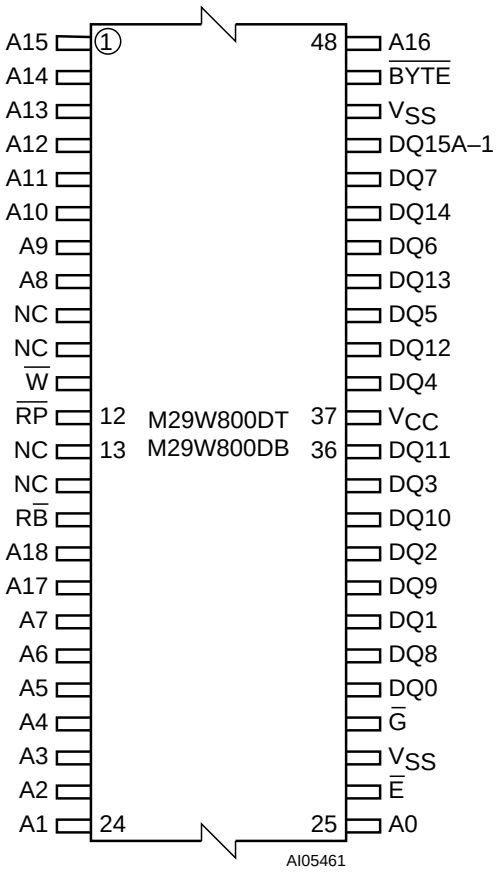


Figure 4. TSOP Connections



FAIRCHILD SEMICONDUCTOR®

www.fairchildsemi.com

MC78XX/LM78XX/MC78XXA

3-Terminal 1A Positive Voltage Regulator

Features

- Output Current up to 1A
- Output Voltages of 5, 6, 8, 9, 10, 12, 15, 18, 24V
- Thermal Overload Protection
- Short Circuit Protection
- Output Transistor Safe Operating Area Protection

Description

The MC78XX/LM78XX/MC78XXA series of three terminal positive regulators are available in the TO-220/D-PAK package and with several fixed output voltages, making them useful in a wide range of applications. Each type employs internal current limiting, thermal shut down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

TO-220

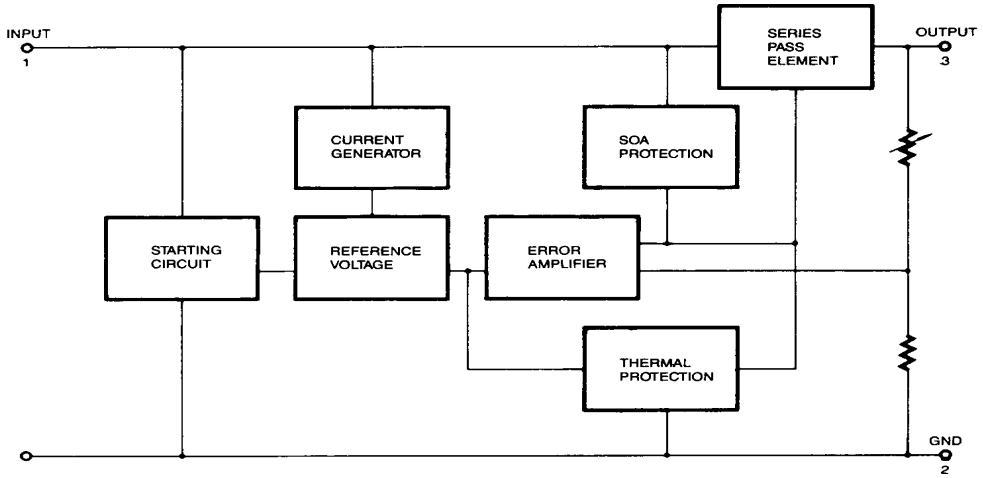
1

D-PAK

1

1. Input 2. GND 3. Output

Internal Block Digram



Rev. 1.0.1

JRC

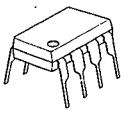
NJM2068

LOW-NOISE DUAL OPERATIONAL AMPLIFIER

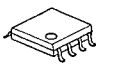
■ GENERAL DESCRIPTION

The NJM2068 is a high performance, low noise dual operational amplifier. This amplifier features popular pin-out, superior noise performance, and superior total harmonic distortion. This amplifier also features guaranteed noise performance with substantially higher gain-bandwidth product and slew rate which far exceeds that of the 4558 type amplifier. The specially designed low noise input transistors allow the NJM2068 to be used in very low noise signal processing applications such as audio preamplifiers and servo error amplifier.

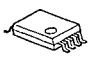
■ PACKAGE OUTLINE



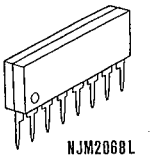
NJM2068D



NJM2068M



NJM2068V



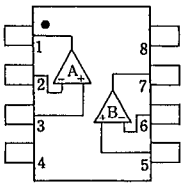
NJM2068L

■ FEATURES

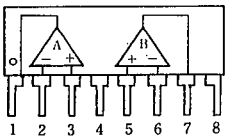
- Operating Voltage (±4V~±18V)
- Low Total Harmonic Distortion (0.001% typ.)
- Low Noise Voltage (FLAT+JISA, 0.56 μV typ.)
- High Slew Rate (6V/μs typ.)
- Unity Gain Bandwidth (27MHz @f=10kHz)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

4

■ PIN CONFIGURATION



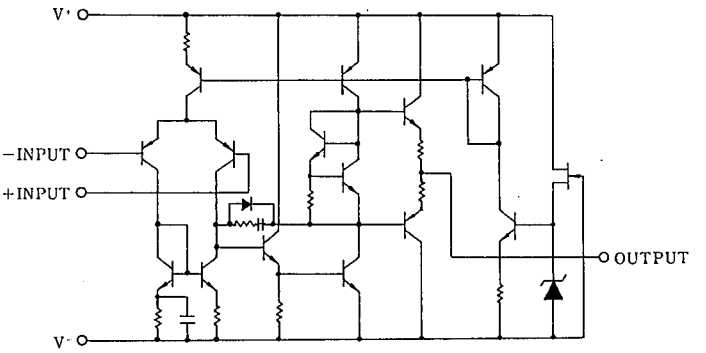
NJM2068D
NJM2068M
NJM2068V



NJM2068L

PIN FUNCITON
1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

■ EQUIVALENT CIRCUIT (1/2 Shown)



JRC **NJM2391**

LOW DROPOUT VOLTAGE REGULATOR

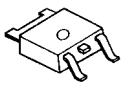
■ GENERAL DESCRIPTION

The NJM2391 is low dropout voltage regulators featuring high precision voltage.

It is suitable for Notebook PCs, PC cards and hard disks where 3.3V need to be generated from 5V supply.

A small TO-252 package is adopted for the space saving.

■ PACKAGE OUTLINE

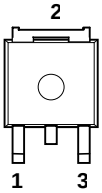


NJM2391DL1

■ FEATURES

- ●Output Current Io(max.)=1A
- ●High Precision Output Voltage Vo±1%
- ●Low Dropout Voltage ΔV_{I-O} =1.1V typ. At Io=1A
- ●Internal Excessive Voltage Protection Circuit
- ●Internal Short Circuit Current Limit
- ●Internal Thermal Overload Protection
- ●Bipolar Technology
- ●Package Outline TO-252

■ PIN CONFIGURATION



PIN FUNCTION
1.V_{IN}
2.GND
3.V_{OUT}

NJM2391DL1

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V^+	+10	V
Power Dissipation	P_D	TO-252 8 (Tc=25°C) 0.8(Ta≤25°C)	W
Operating Temperature	Topr	–40 ~ +85	°C
Storage Temperature	Tstg	–50 ~ +125	°C

■ OUTPUT VOLTAGE RANK LIST

Device Name	V_{OUT}
NJM2391DL1-25	2.5V
NJM2391DL1-26	2.6V
NJM2391DL1-28	2.85V
NJM2391DL1-03	3.0V
NJM2391DL1-33	3.3V
NJM2391DL1-35	3.5V
NJM2391DL1-05	5.0V

JRC **NJM2595**

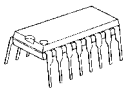
5-INPUT 3-OUTPUT VIDEO SWITCH

■ GENERAL DESCRIPTION

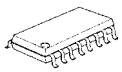
The **NJM2595** is a 5-input 3-output video switch. Its switches select one from five signals received from VTR,TV,DVD, TV-GAME and others.

The NJM2595 is designed for audio items, such as AV amplifier and others.

■ PACKAGE OUTLINE



NJM2595D

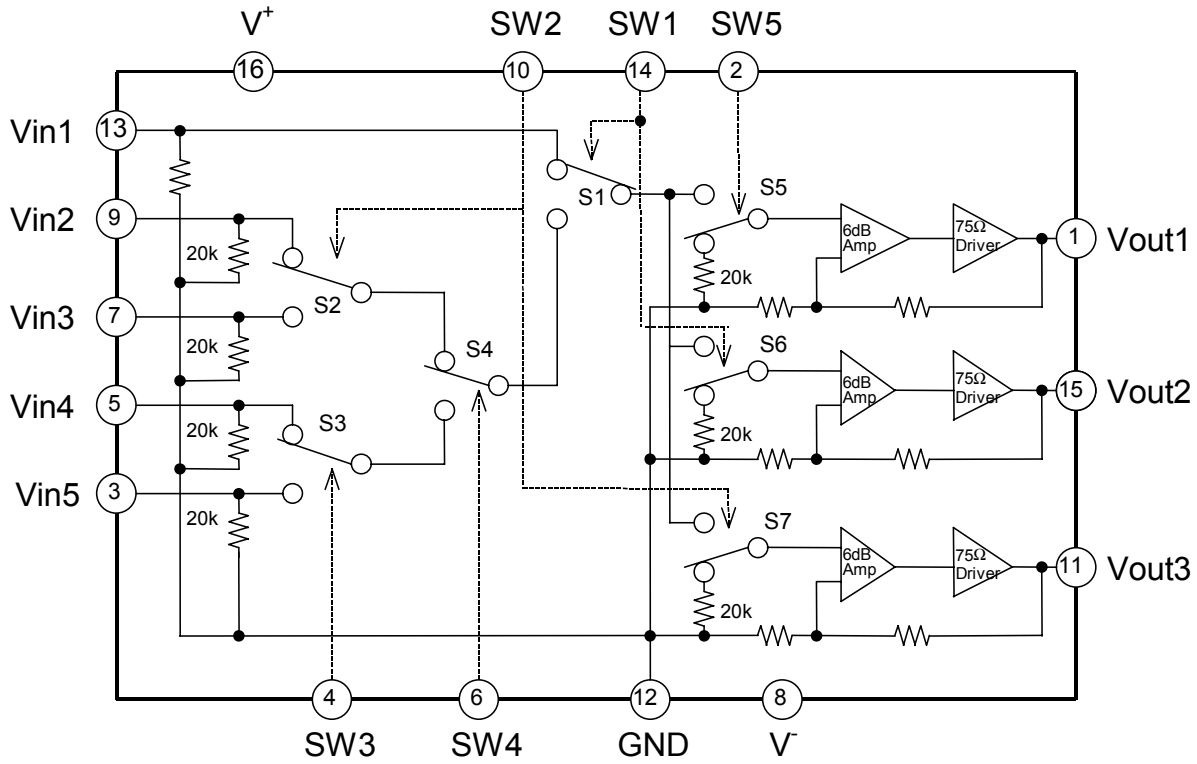


NJM2595M

■ FEATURES

- 5-input 3-output
- Operating Voltage ±4.0 to ±6.5V
- Operating current ±15mAtyp. at Vcc=±5V
- Crosstalk -65dBtyp.
- Internal 6dB Amplifier
- Internal 75Ω Driver
- Bipolar Technology
- Package Outline DIP16,DMP16

■ PIN CONFIGURATION and BLOCK DIAGRAM



JRC

NJM4556A

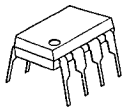
DUAL HIGH CURRENT OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

The NJM4556A integrated circuit is a high-gain, high output current dual operational amplifier capable of driving ±70mA into 150 Ω loads (±10.5V output voltage), and operating low supply voltage (V^+/V^-=±2V~).

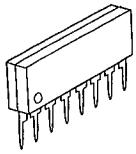
The NJM4556A combines many of the fetures of the popular NJM4558 as well as having the capability of driving 150Ω loads. In addition, the wide band-width, low noise, high slew rate and low distortion of the NJM4556A make it ideal for many audio, telecommunications and instrumentation applications.

■ PACKAGE OUTLINE

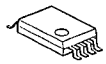


NJM4556AD

NJM4556AM



NJM4556AL

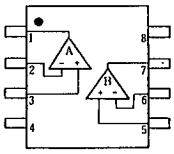


NJM4556AV

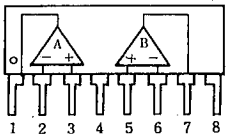
■ FEATURES

- Operating Voltage (±2V~±18V)
- High Output Current (Io=70mA)
- Slew Rate (3V/μs typ.)
- Gain Band Width Product (8MHz typ.)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

■ PIN CONFIGURATION



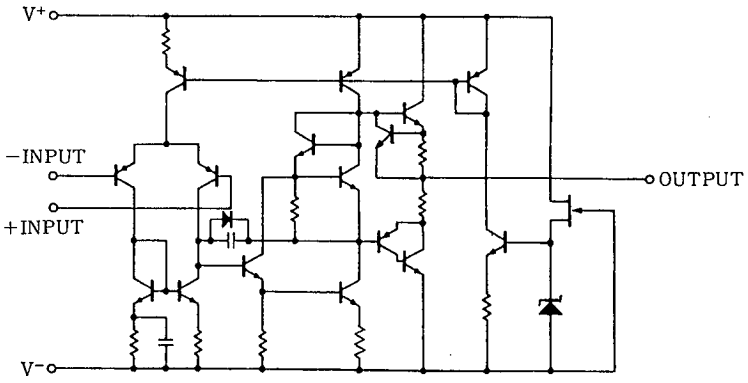
NJM4556AD
NJM4556AM
NJM4556AV



NJM4556AL

PIN FUNCTION
1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

■ EQUIVALENT CIRCUIT (1/2 Shown)



JRC

NJM7800

3-TERMINAL POSITIVE VOLTAGE REGULATOR

■ GENERAL DESCRIPTION

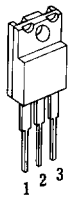
The NJM7800 series of monolithic 3-Terminal Positive Voltage Regulators is constructed using the New JRC Planar epitaxial process. These regulators employ internal current-limiting, thermal-shutdown and safe-area compensation making them essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. They are intended as fixed voltage regulators in a wide range of applications including local (on card) regulation for elimination of distribution problems associated with single point regulation. In addition to use as fixed voltage regulators, these devices can be used with external components to obtain adjustable output voltages and currents.

■ FEATURES

- Operating Voltage
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Excellent Ripple Rejection
- Guarantee'd 1.5A Output Current
- Package Outline TO-220F, TO-252
- Bipolar Technology

■ PACKAGE OUTLINE

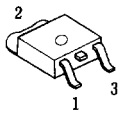
(TO-220F)



NJM7800FA

1. IN
2. GND
3. OUT

(TO-252)

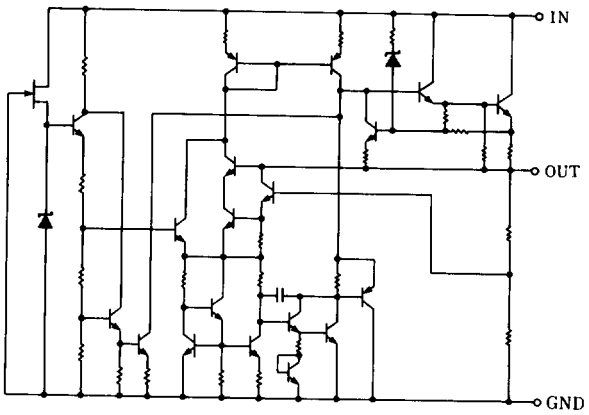


NJM7800DLA

1. IN
2. GND
3. OUT

(note) The radiation fin is connected pin2.

■ EQUIVALENT CIRCUIT



6

JRC

NJM7900

3-TERMINAL NEGATIVE VOLTAGE REGULATOR

■ GENERAL DESCRIPTION

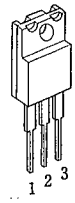
The NJM7900 series of Monolithic 3-Terminal Negative Regulators is constructed using the New JRC Planar epitaxial process. These negative regulators are intended as complements to the popular NJM7800 series of positive voltage regulators, and they are available in the same voltage options from −5 to −24V. The 7900 series employ internal current-limiting, safe-area protection, and thermal shutdown, making the virtually indestructible.

■ FEATURES

- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Excellent Ripple Rejection
- Guarantee'd 1.5A Output Current
- Package Outline TO-220F
- Bipolar Technology

■ PACKAGE OUTLINE

(TO-220F)

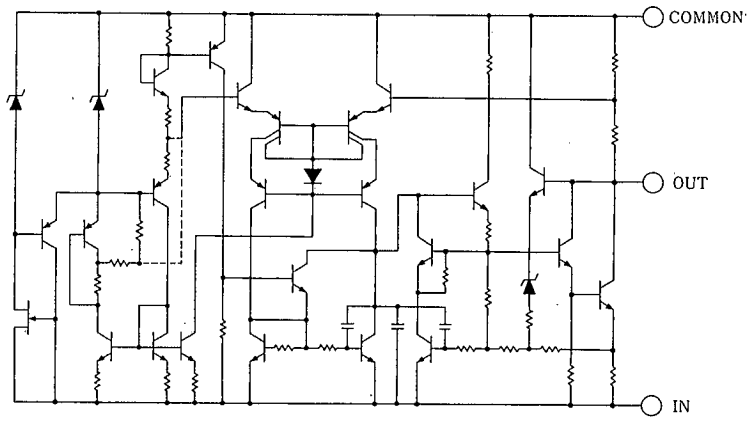


1. COMMON
2. IN
3. OUT

NJM7900FA

(note) The radiation fin is connected to Pin 2.

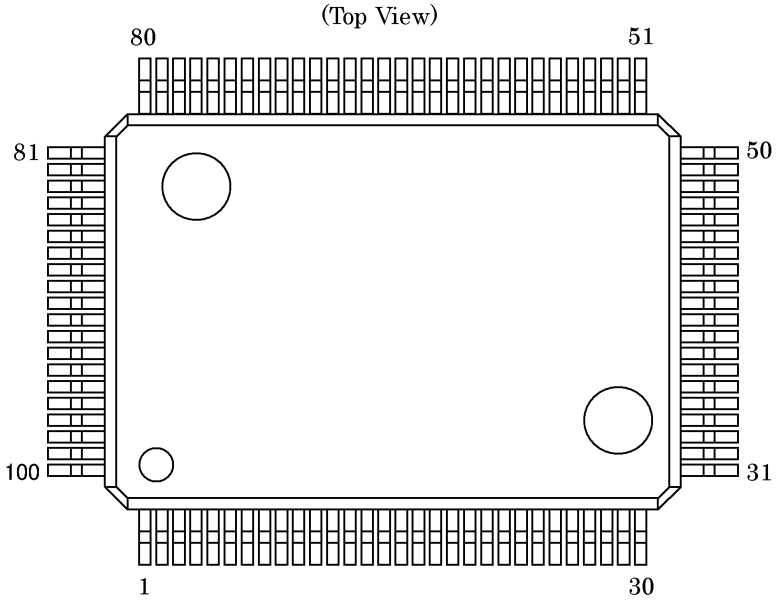
■ EQUIVALENT CIRCUIT



6

■PIN CONFIGURAITON

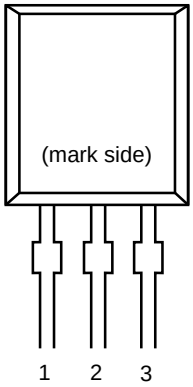
BEE-45919-000-00



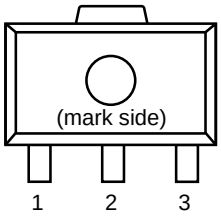
No.	SYMBOL	No.	SYMBOL	No.	SYMBOL	No.	SYMBOL
1	ROUT	26	DCCAP_RS	51	DCR_IN	76	GND
2	COUT	27	L3IN	52	DCR_OUT	77	LSCIN
3	LSOUT	28	DCCAP_LS	53	GND	78	RSCIN
4	RSOUT	29	R3IN	54	DCL_IN	79	LBCIN
5	LBOUT	30	DCCAP_C	55	DCL_OUT	80	RBCIN
6	RBOUT	31	L4IN	56	GND	81	GND
7	SWOUT	32	DCCAP_R	57	REC_B1R	82	LAIN
8	GND	33	R4IN	58	REC_B1L	83	RAIN
9	FIL_BL2	34	DCCAP_L	59	REC_A4R	84	CAIN
10	FIL_BL1	35	L5IN	60	REC_A4L	85	LSAIN
11	FIL_TL	36	GND	61	REC_A3R	86	RSAIN
12	TCAP	37	R5IN	62	REC_A3L	87	LBAIN
13	FIL_BR2	38	GND	63	REC_A2R	88	RBAIN
14	FIL_BR1	39	L6IN	64	REC_A2L	89	SWAIN
15	FIL_TR	40	L9IN	65	REC_A1R	90	GND
16	V^+	41	R6IN	66	REC_A1L	91	LBIN
17	ADR	42	R9IN	67	VDDOUT	92	RBIN
18	V^-	43	L7IN	68	DATA	93	CBIN
19	L1IN	44	L10IN	69	CLOCK	94	LSBIN
20	DCCAP_SW	45	R7IN	70	LATCH	95	RSBIN
21	R1IN	46	R10IN	71	MUTE	96	LBBIN
22	DCCAP_RB	47	L8IN	72	FL+	97	RBBIN
23	L2IN	48	L11IN	73	FL-	98	SWBIN
24	DCCAP_LB	49	R8IN	74	FR+	99	GND
25	R2IN	50	R11IN	75	FR-	100	LOUT

PIN CONFIGURATION

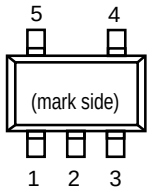
• TO-92



• SOT-89



• SOT-23-5



PIN DESCRIPTION

• TO-92

Pin No	Symbol
1	OUT
2	VDD
3	GND

• SOT-89

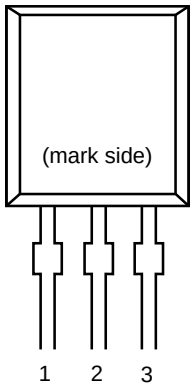
Pin No	Symbol
1	OUT
2	VDD
3	GND

• SOT-23-5

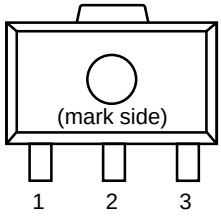
Pin No	Symbol
1	OUT
2	VDD
3	GND
4	NC
5	NC

PIN CONFIGURATION

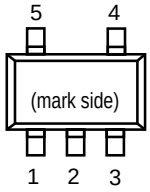
• TO-92



• SOT-89



• SOT-23-5



PIN DESCRIPTION

• TO-92

Pin No.	Symbol
1	OUT
2	V_{DD}
3	GND

• SOT-89

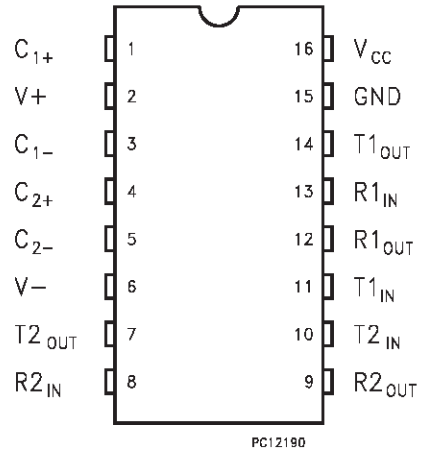
Pin No.	Symbol
1	OUT
2	V_{DD}
3	GND

• SOT-23-5

Pin No.	Symbol
1	OUT
2	V_{DD}
3	GND
4	NC
5	NC

ST202E/ST232E

PIN CONFIGURATION



PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
1	C_1+	Positive Terminal for the first Charge Pump Capacitor
2	V+	Doubled Voltage Terminal
3	C_1-	Negative Terminal for the first Charge Pump Capacitor
4	C_2+	Positive Terminal for the second Charge Pump Capacitor
5	C_2-	Negative Terminal for the second Charge Pump Capacitor
6	V-	Inverted Voltage Terminal
7	$T2_{OUT}$	Second Transmitter Output Voltage
8	$R2_{IN}$	Second Receiver Input Voltage
9	$R2_{OUT}$	Second Receiver Output Voltage
10	$T2_{IN}$	Second Transmitter Input Voltage
11	$T1_{IN}$	First Transmitter Input Voltage
12	$R1_{OUT}$	First Receiver Output Voltage
13	$R1_{IN}$	First Receiver Input Voltage
14	$T1_{OUT}$	First Transmitter Output Voltage
15	GND	Ground
16	V_{CC}	Supply Voltage

2. Pin Assignment and Pin Functions

The assignment of input/output pins for the T5CC1, their names and functions are as follows:

2.1 Pin Assignment Diagram

Figure 2.1.1 shows the pin assignment of the T5CC1.

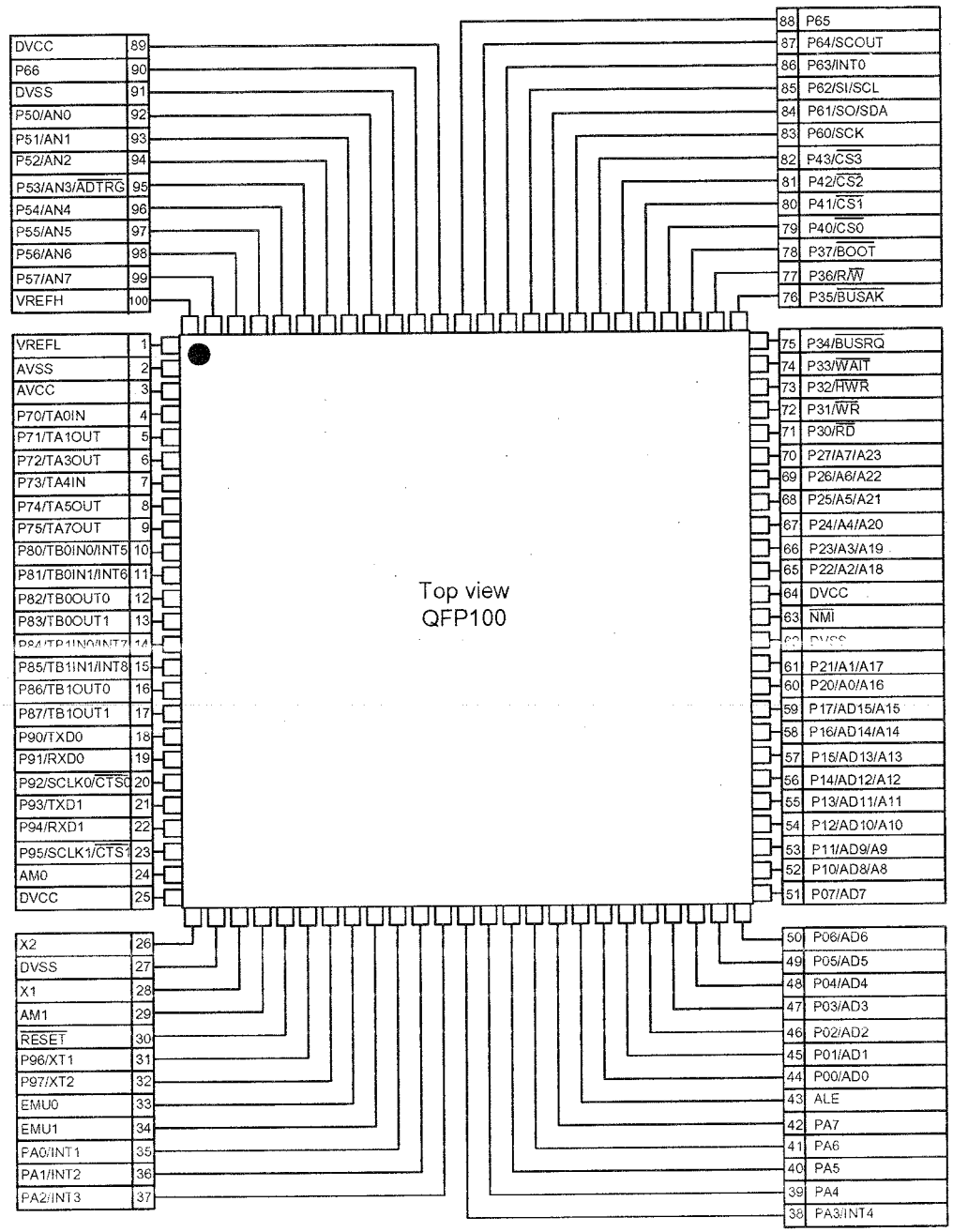


Figure 2.1.1 Pin assignment diagram (100-pin LQFP)

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC74HCU04AP, TC74HCU04AF, TC74HCU04AFN

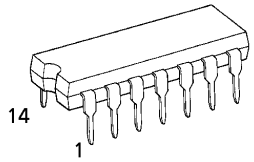
HEX INVERTER

(Note) The JEDEC SOP (FN) is not available in Japan.

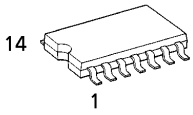
The TC74HCU04A is a high speed CMOS INVERTER fabricated with silicon gate C²MOS technology.
It achieves the high speed operation similar to equivalent LSTTL while maintaining the CMOS low power dissipation.
Since the internal circit is composed of a single stage inverter, it can be used in analog applications such as crystal oscllators.
All inputs are equipped with protection circuits against static discharge or transient excess voltage.

FEATURES :

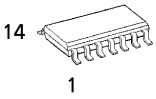
- High Speed ····· t_{pd} = 4ns(typ.) at V_{CC} = 5V
- Low Power Dissipation ····· I_{CC} = 1 μA(Max.) at Ta = 25°C
- High Noise Immunity ····· V_{NIH} = V_{NIH} = 10% V_{CC} (Min.)
- Output Drive Capability ····· 10 LSTTL Loads
- Symmetrical Output Impedance ··· $|I_{OH}|$ = I_{OL} = 4mA(Min.)
- Balanced Propagation Delays ····· $t_{pLH} \simeq t_{pHL}$
- Wide Operating Voltage Range ·· V_{CC}(opr.) = 2V ~ 6V
- Pin and Function Compatible with 74LS04



P (DIP14-P-300-2.54)
Weight : 0.96g (Typ.)

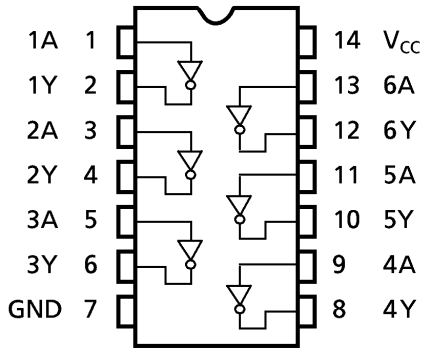


F (SOP14-P-300-1.27)
Weight : 0.18g (Typ.)



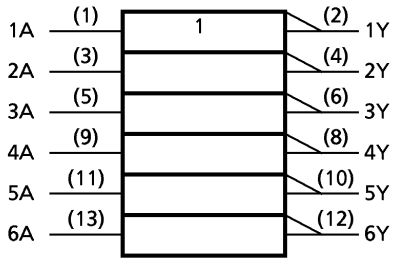
FN (SOL14-P-150-1.27)
Weight : 0.12g (Typ.)

PIN ASSIGNMENT



(TOP VIEW)

IEC LOGIC SYMBOL



TRUTH TABLE

A	Y
L	H
H	L

961001EBA2

TOSHIBA TC74HCU04AP/AF/AFN

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC74HCU04AP, TC74HCU04AF, TC74HCU04AFN

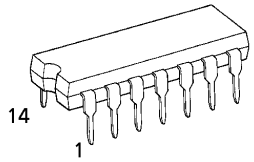
HEX INVERTER

(Note) The JEDEC SOP (FN) is not available in Japan.

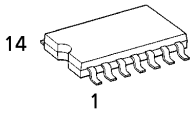
The TC74HCU04A is a high speed CMOS INVERTER fabricated with silicon gate C^2MOS technology.
It achieves the high speed operation similar to equivalent LSTTL while maintaining the CMOS low power dissipation.
Since the internal circit is composed of a single stage inverter, it can be used in analog applications such as crystal oscllators.
All inputs are equipped with protection circuits against static discharge or transient excess voltage.

FEATURES :

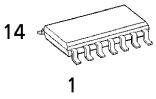
- High Speed ····· t_{pd} = 4ns(typ.) at V_{CC} = 5V
- Low Power Dissipation ····· I_{CC} = 1 μA(Max.) at Ta = 25°C
- High Noise Immunity ····· $V_{NIH} = V_{NIH}$ = 10% V_{CC} (Min.)
- Output Drive Capability ····· 10 LSTTL Loads
- Symmetrical Output Impedance ··· $|I_{OH}| = I_{OL}$ = 4mA(Min.)
- Balanced Propagation Delays ····· $t_{pLH} \simeq t_{pHL}$
- Wide Operating Voltage Range ·· V_{CC}(opr.) = 2V ~ 6V
- Pin and Function Compatible with 74LS04



P (DIP14-P-300-2.54)
Weight : 0.96g (Typ.)

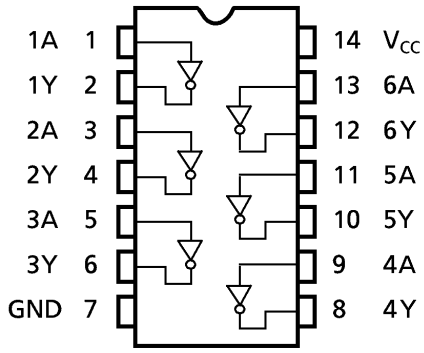


F (SOP14-P-300-1.27)
Weight : 0.18g (Typ.)



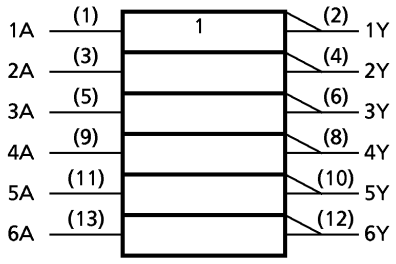
FN (SOL14-P-150-1.27)
Weight : 0.12g (Typ.)

PIN ASSIGNMENT



(TOP VIEW)

IEC LOGIC SYMBOL



TRUTH TABLE

A	Y
L	H
H	L

961001EBA2

● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC74VHC157F, TC74VHC157FN, TC74VHC157FT

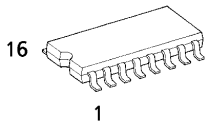
QUAD 2 - CHANNEL MULTIPLEXER

(Note) The JEDEC SOP (FN) is not available in Japan.

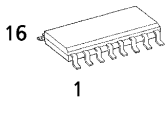
The TC74VHC157 is an advanced high speed CMOS QUAD 2 - CHANNEL MULTIPLEXER fabricated with silicon gate C^2MOS technology.
It achieves the high speed operation similar to equivalent Bipolar Schottky TTL while maintaining the CMOS low power dissipation.
It consists of four 2 - input digital multiplexers with common select and strobe inputs.
When the $\overline{STROBE}$ input is held "H" level, selection of data is inhibited and all the outputs become "L" level.
The SELECT decoding determines whether the A or B inputs get routed to their corresponding Y outputs.
An Input protection circuit ensures that 0 to 5.5V can be applied to the input pins without regard to the supply voltage. This device can be used to interface 5V to 3V systems and on two supply systems such as battery back up. This circuit prevents device destruction due to mismatched supply and input voltages.

FEATURES :

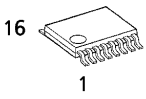
- High Speed ····· t_{pd} = 4.1ns(typ.) at V_{CC} = 5V
- Low Power Dissipation ····· I_{CC} = 4μA(Max.) at Ta = 25°C
- High Noise Immunity ····· $V_{NIH} = V_{NIL}$ = 28% V_{CC} (Min.)
- Power Down Protection is provided on all inputs.
- Balanced Propagation Delays ····· $t_{pLH} \simeq t_{pHL}$
- Wide Operating Voltage Range ···· V_{CC} (opr) = 2V ~ 5.5V
- Low Noise ····· V_{OLP} = 0.8V (Max.)
- Pin and Function Compatible with 74ALS157



F (SOP16-P-300-1.27)
Weight : 0.18g (Typ.)

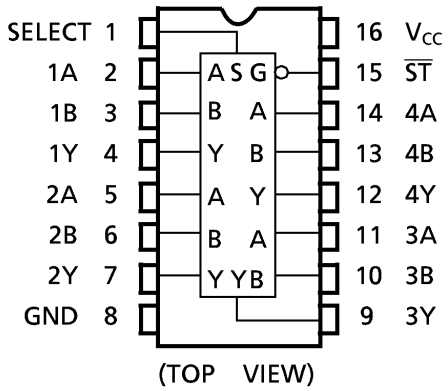


FN (SOL16-P-150-1.27)
Weight : 0.13g (Typ.)



FT (TSSOP16-P-0044-0.65)
Weight : 0.06g (Typ.)

PIN ASSIGNMENT

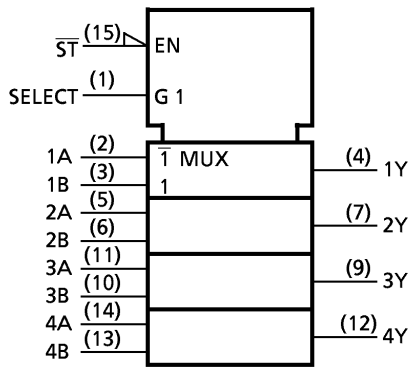


TRUTH TABLE

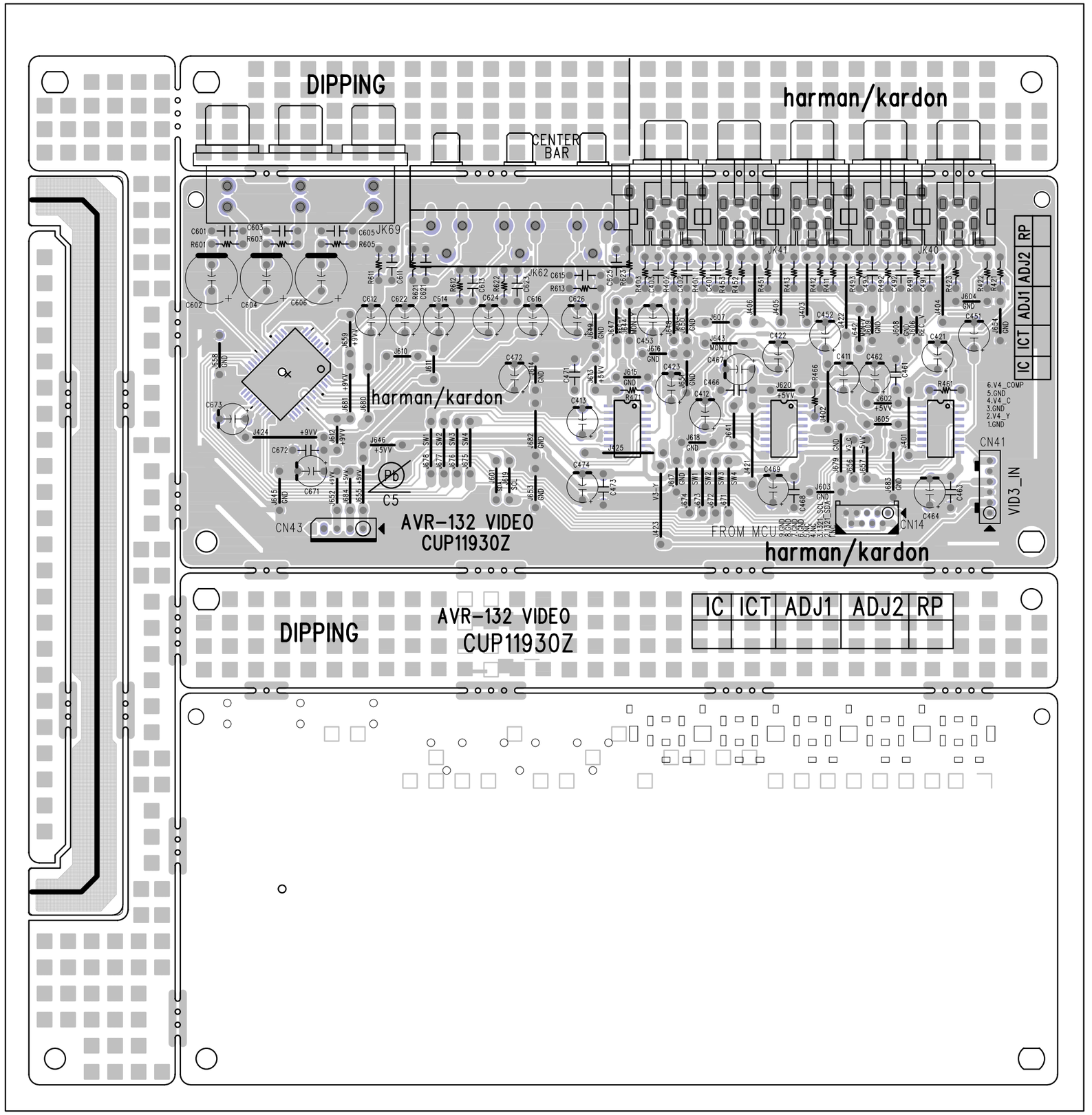
INPUTS				OUTPUT
$\overline{ST}$	SELECT	A	B	
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

X : Don't Care

IEC LOGIC SYMBOL



980910EBA2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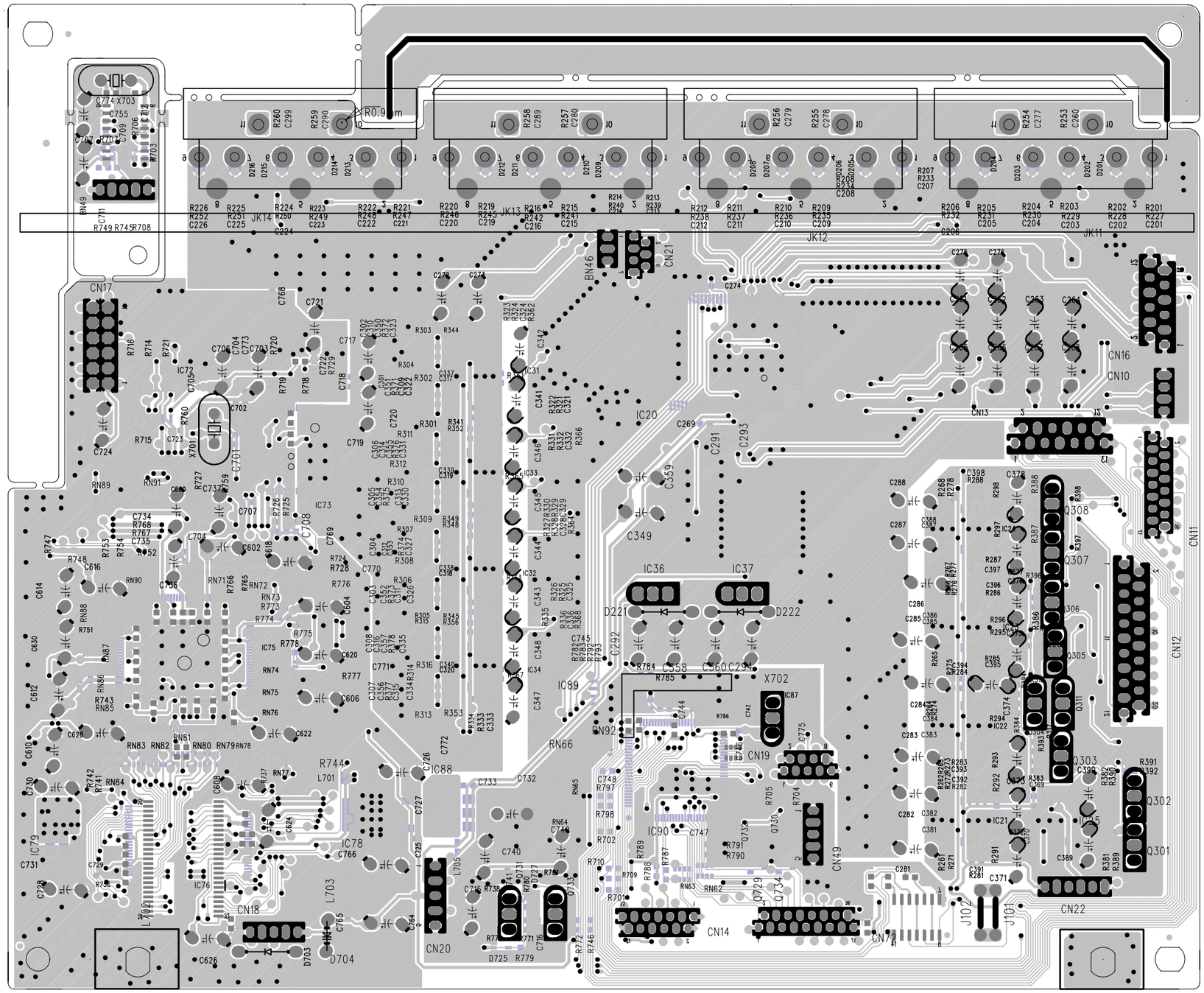
CENTER BAR
harman/kardon
JK69
JK62
JK41
JK40
IC ICT ADJ1 ADJ2 RP
AVR-132 VIDEO
CUP11930Z
CN43
CN14
CN41
VID3_IN
FROM MCU
6.V4_COMP
5.GND
4.V4_C
3.GND
2.V4_Y
1.GND
DIPPING
AVR-132 VIDEO
CUP11930Z
IC ICT ADJ1 ADJ2 RP


R0.9ohm
JK11
JK12
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CN17
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CN21
CN22
CN49
BN46
IC20
IC36
IC37
IC73
IC78
IC79
IC88
IC89
IC90
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D704
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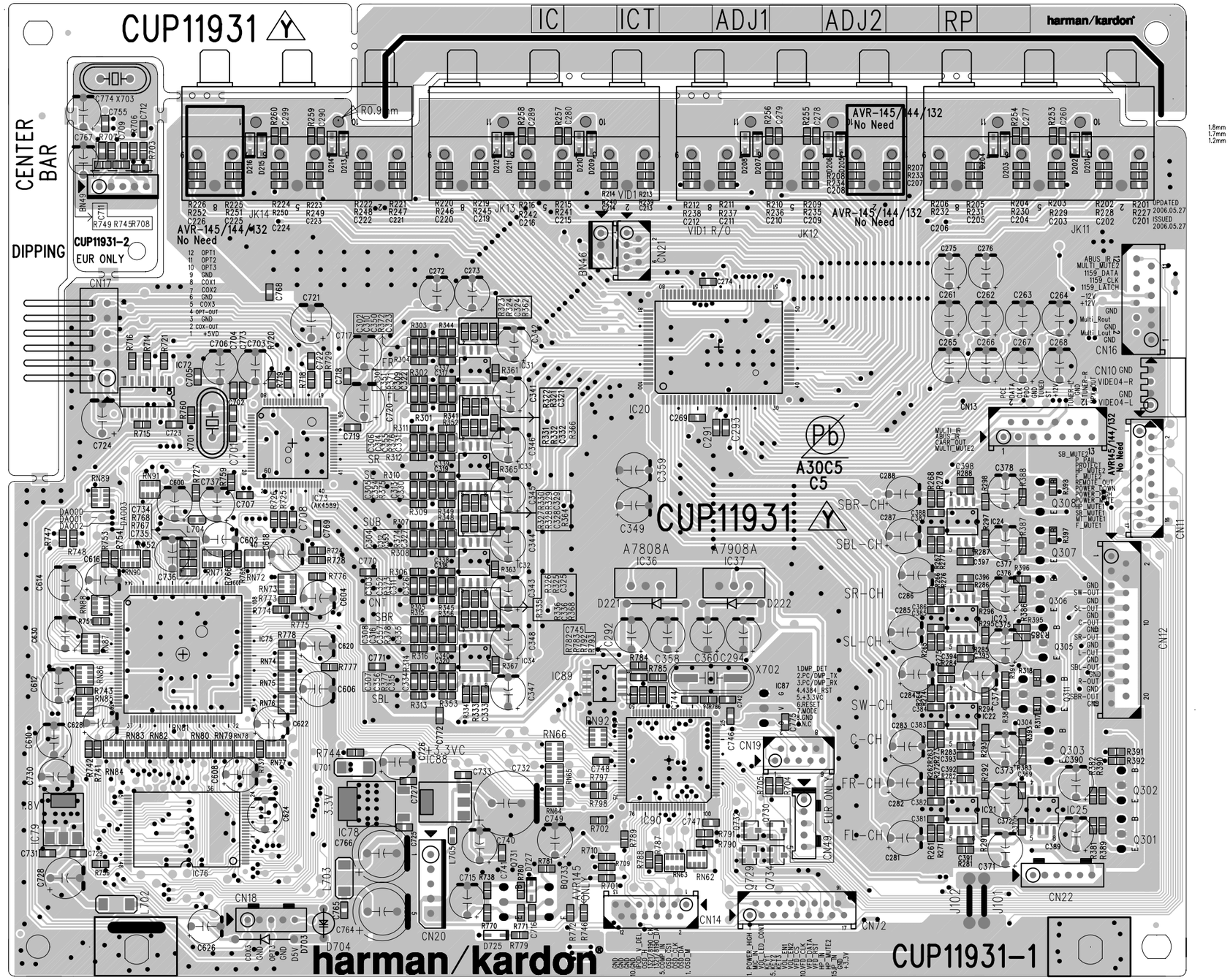
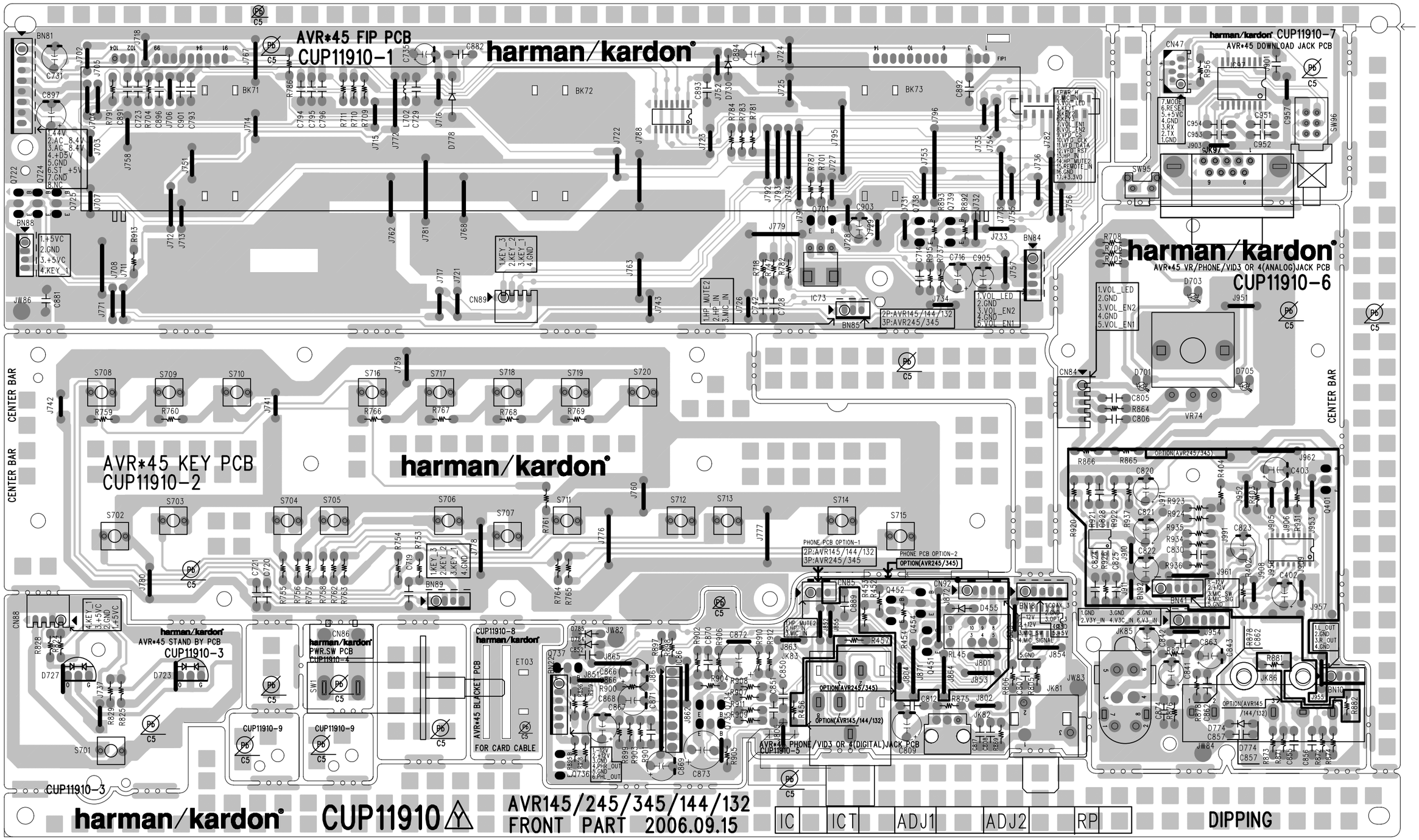
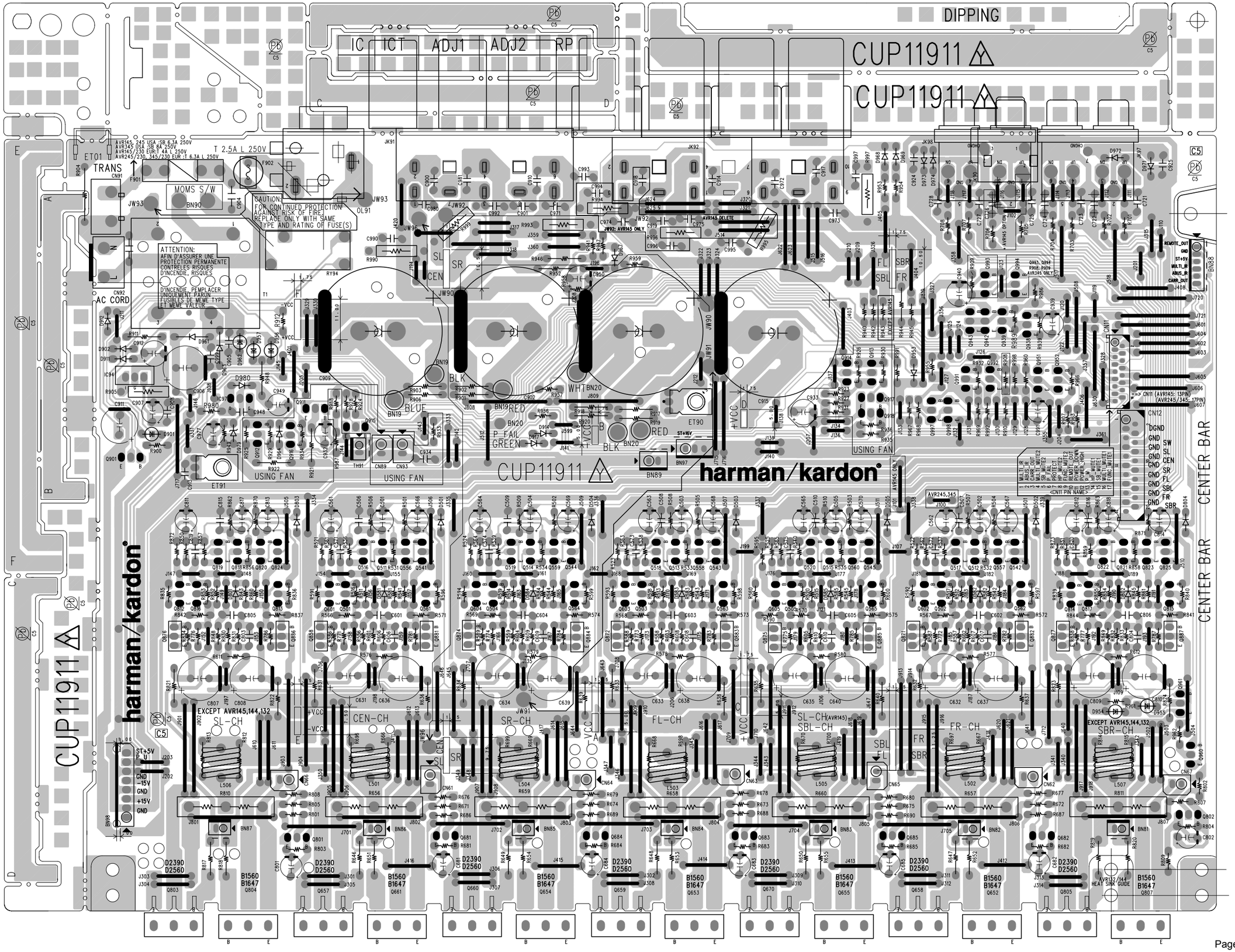
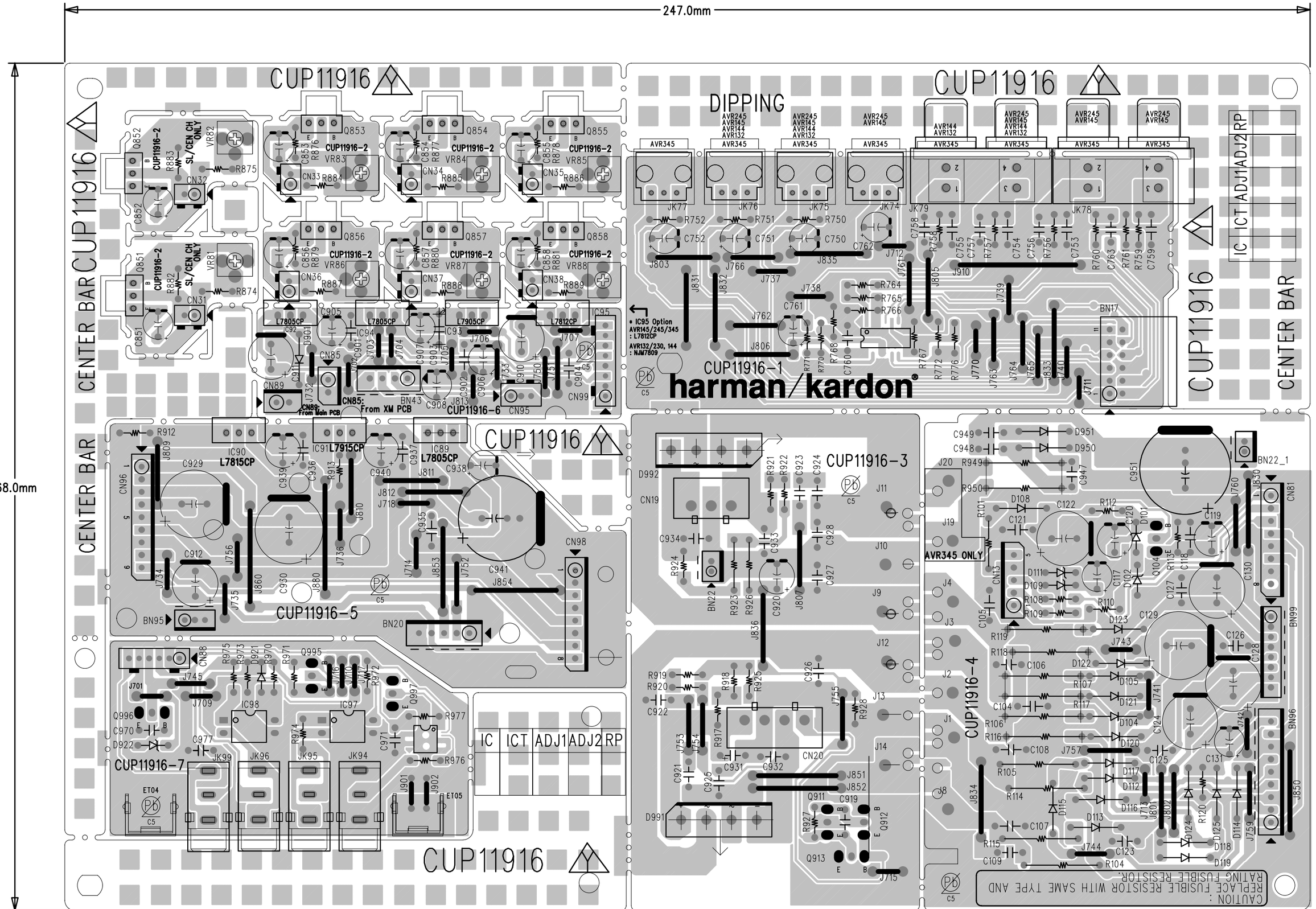
J101
J102


CUP11931
CUP11931-1
CUP11931-2
EUR ONLY
DIPPING
CENTER BAR
IC
ICT
ADJ1
ADJ2
RP
harman/kardon
AVR-145/144/132
No Need
A30C5
C5
SBR-CH
SBL-CH
SR-CH
SL-CH
SW-CH
C-CH
FR-CH
FL-CH
UPDATED 2006.05.27
ISSUED 2006.05.27

AVR 137/230

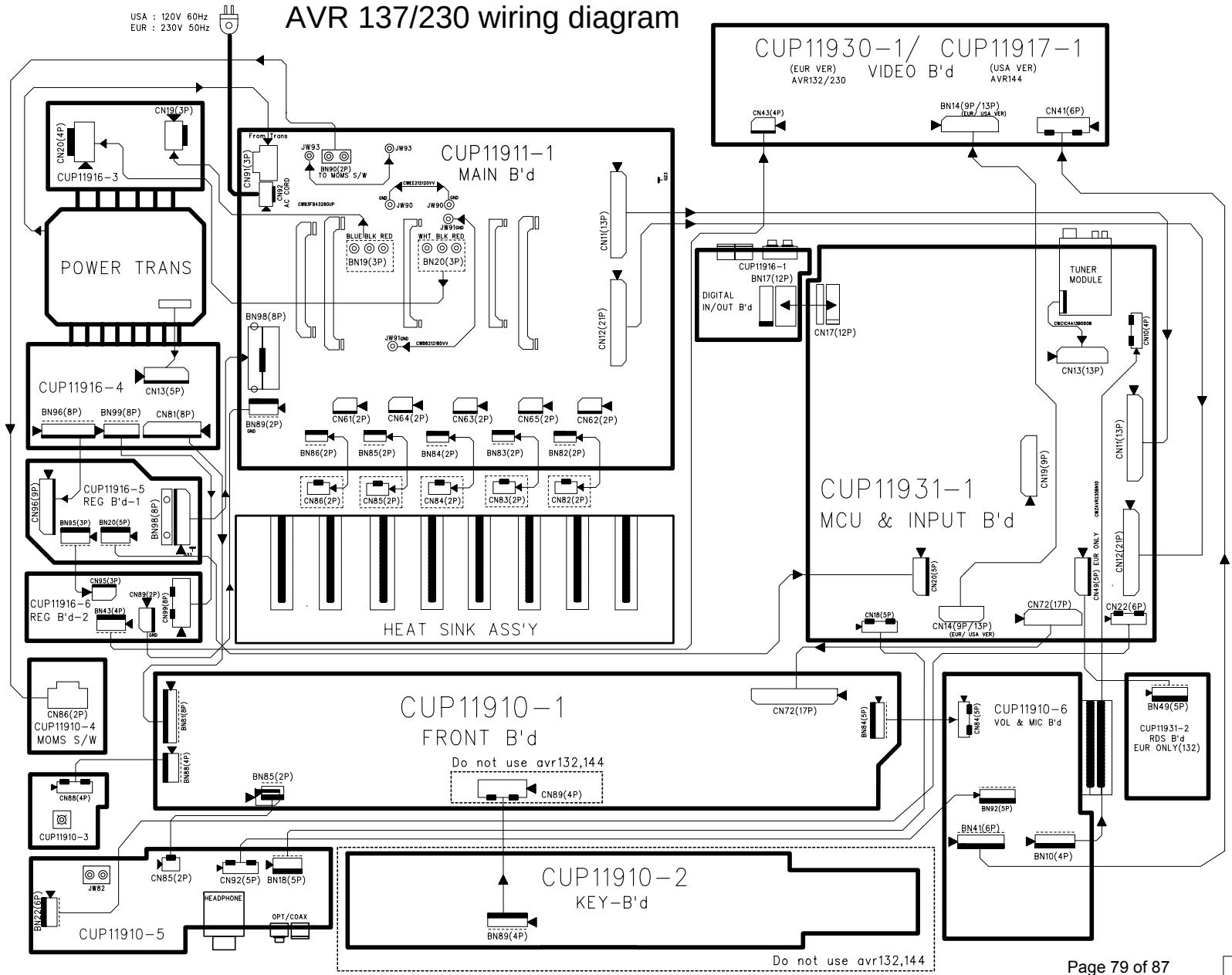

AVR*45 FIP PCB
CUP11910-1
harman/kardon
harman/kardon CUP11910-7
AVR*45 DOWNLOAD JACK PCB
harman/kardon
AVR*45 VR/PHONE/VID3 OR 4(ANALOG)JACK PCB
CUP11910-6
AVR*45 KEY PCB
CUP11910-2
harman/kardon
harman/kardon
AVR*45 STAND BY PCB
CUP11910-3
harman/kardon
PWR.SW PCB
CUP11910-4
CUP11910-8
harman/kardon
AVR*45 BLACKET PCB
FOR CARD CABLE
AVR*45 PHONE/VID3 OR 4(DIGITAL)JACK PCB
CUP11910-5
CUP11910-9
CUP11910-9
CUP11910-3
CENTER BAR
CENTER BAR
harman/kardon CUP11910
AVR145/245/345/144/132
FRONT PART 2006.09.15
IC ICT ADJ1 ADJ2 RP
DIPPING


DIPPING
CUP11911
IC ICT ADJ1 ADJ2 RP
TRANS
MOMS S/W
AC CORD
USING FAN
harman/kardon
CENTER BAR
SL-CH
CEN-CH
SR-CH
FL-CH
SL-CH(AVR145)
SBL-CH
FR-CH
SBR-CH
EXCEPT AVR145,144,132
EXCEPT AVR145,144,132
AVR245,345
AVR137/144 HEAT SINK GUIDE


247.0mm
168.0mm
CUP11916
CENTER BAR
CUP11916-1
CUP11916-2
CUP11916-3
CUP11916-4
CUP11916-5
CUP11916-6
CUP11916-7
DIPPING
AVR345
IC ICT ADJ1ADJ2RP
harman/kardon
* IC95 Option
AVR145/245/345 : L7812CP
AVR132/230, 144 : NJM7809
CN85: From XM PCB
CN89: From Main PCB
AVR345 ONLY
CAUTION : REPLACE FUSIBLE RESISTOR WITH SAME TYPE AND RATING FUSIBLE RESISTOR.

AVR 137/230 BLOCK DIAGRAM

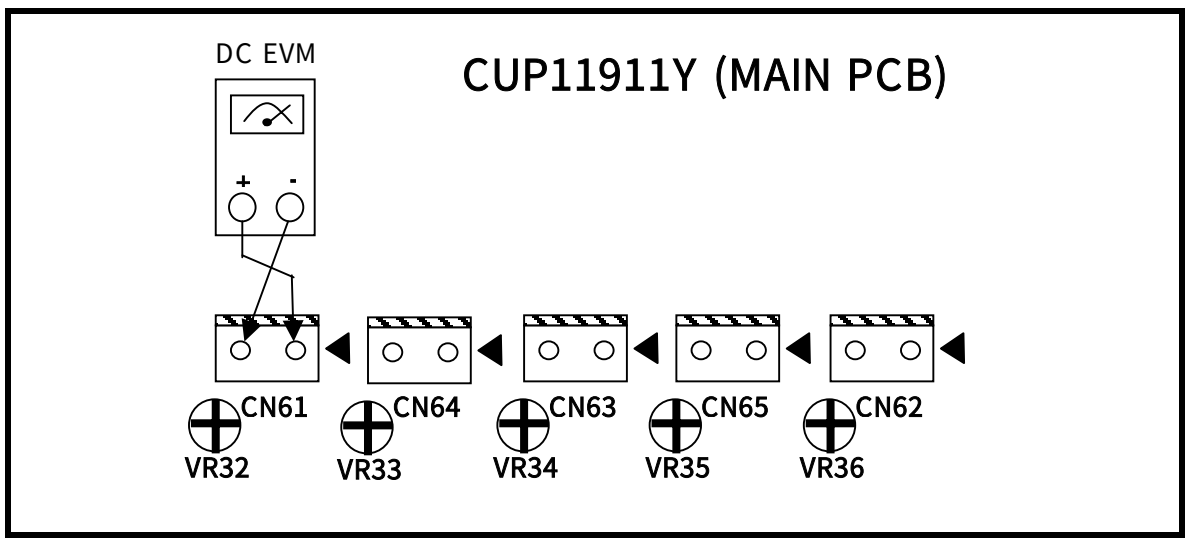
AVR 137/230 wiring diagram



AMPLIFIER SECTION BIAS ADJUSTMENT

Measurement condition
.No input signal or volume position is minimum.

Standard value
.Ideal current = 48mA (± 5%)
.Ideal DC Voltage = 25.92mV (± 5%)

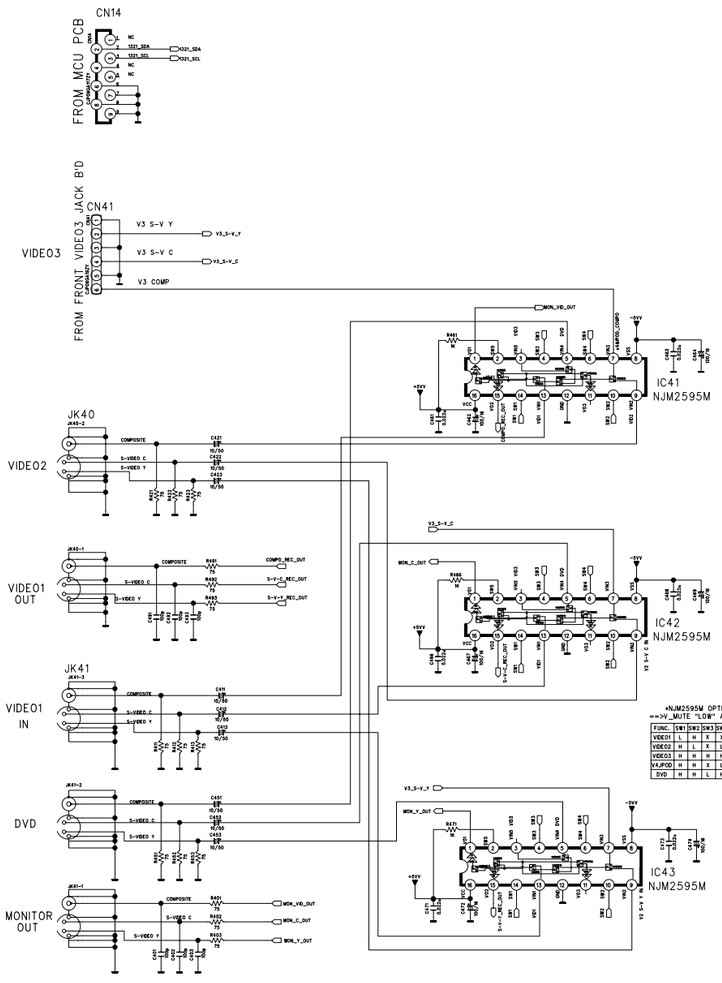


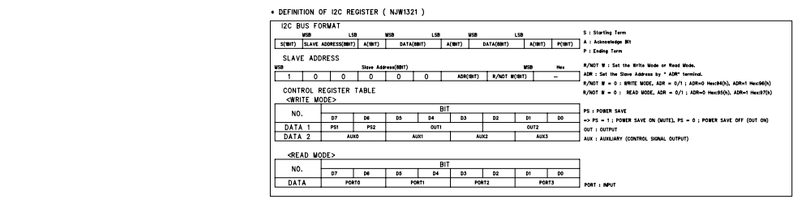
DC VOLTMETER ; Connect to
CN66(SL),CN61(CEN),CN64(SR),CN63(FL),CN65(SBL/SL(AVR132,144,145)),CN62(FR),CN67(SBR)

NO.	Channel	Adjust for	Adjustment
1	Front Left	25.92mV (± 5%)	CN63
2	Front Right	25.92mV (± 5%)	CN62
3	Center	25.92mV (± 5%)	CN61
4	Surround Left	25.92mV (± 5%)	CN65
5	Surround Right	25.92mV (± 5%)	CN64

AVR 137/230

CUP11930Z





• DEFINITION OF I2C REGISTER (NJW1321)

I2C BUS FORMAT

MSB			LSB	MSB			LSB	MSB			LSB		
S(BIT)	SLAVE ADDRESS(BIT)		A(BIT)	DATA(BIT)			A(BIT)	DATA(BIT)			A(BIT)	P(BIT)	

S : Starting Term
A : Acknowledge Bit
P : Ending Term

SLAVE ADDRESS

MSB	Slave Address(BIT)						MSB	Hex
1	0	0	0	0	0	A0(BIT)	R/NOT W(BIT)	--

R/NOT W : Set the Write Mode or Read Mode.
A0 : Set the Slave Address by " A0" terminal.
R/NOT W = 0 : WRITE MODE, A0 = 0/1 : A0=0 Hex(90), A0=1 Hex(92)
R/NOT W = 0 : READ MODE, A0 = 0/1 : A0=0 Hex(91), A0=1 Hex(93)

CONTROL REGISTER TABLE

<WRITE MODE>

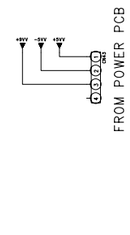
BIT								
NO.	D7	D6	D5	D4	D3	D2	D1	D0
DATA 1	PS1	PS2		OUT1			OUT2	
DATA 2	AUX0		AUX1		AUX2		AUX3	

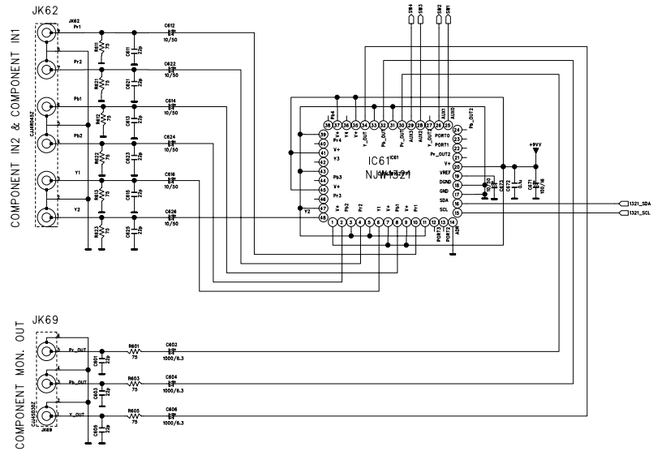
PS : POWER SAVE
=> PS = 1 ; POWER SAVE ON (MUTE), PS = 0 ; POWER SAVE OFF (OUT ON)
OUT : OUTPUT
AUX : AUXILIARY (CONTROL SIGNAL OUTPUT)

<READ MODE>

BIT								
NO.	D7	D6	D5	D4	D3	D2	D1	D0
DATA	PORT0		PORT1		PORT2		PORT3	

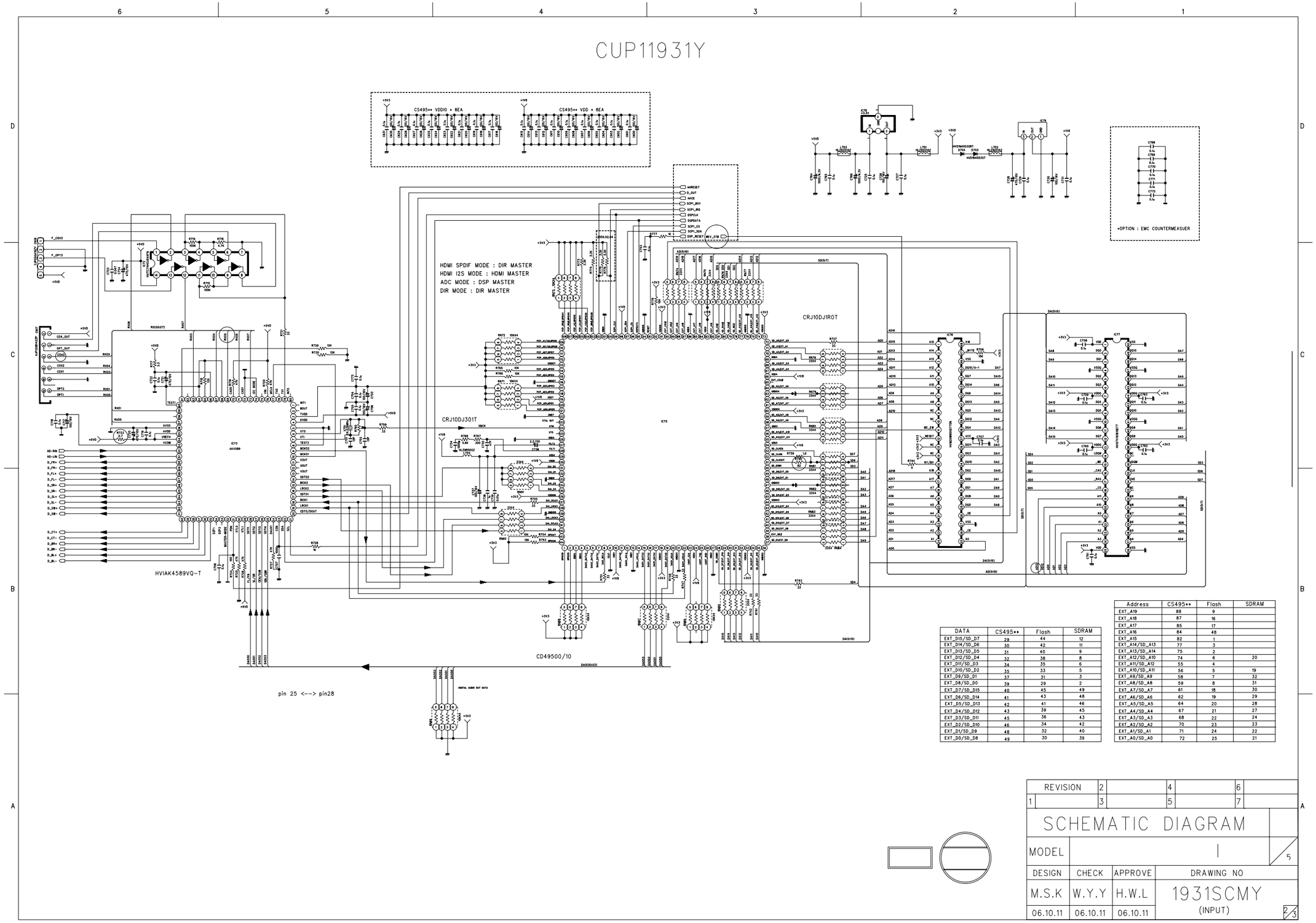
PORT : INPUT





REVISION	2	4	6
1	3	5	7

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR132		5/5
DESIGN	CHECK	APPROVE	DRAWING NO
Y.D.K	Y.W.Y	H.W.L	1930SCMZ
2006.10.11	2006.10.11	2006.10.11	(VIDEO) 1/1



DATA	CS495**	Flash	SDRAM
EXT_D15/SD_D7	29	44	12
EXT_D14/SD_D6	30	42	11
EXT_D13/SD_D5	31	40	9
EXT_D12/SD_D4	32	38	8
EXT_D11/SD_D3	34	35	6
EXT_D10/SD_D2	35	33	5
EXT_D9/SD_D1	37	31	3
EXT_D8/SD_D0	39	29	2
EXT_D7/SD_D15	40	45	49
EXT_D6/SD_D14	41	43	48
EXT_D5/SD_D13	42	41	46
EXT_D4/SD_D12	43	39	45
EXT_D3/SD_D11	45	36	43
EXT_D2/SD_D10	46	34	42
EXT_D1/SD_D9	48	32	40
EXT_D0/SD_D8	49	30	39

Address	CS495**	Flash	SDRAM
EXT_A19	88	9	
EXT_A18	87	16	
EXT_A17	85	17	
EXT_A16	84	48	
EXT_A15	82	1	
EXT_A14/SD_A13	77	3	
EXT_A13/SD_A14	75	2	
EXT_A12/SD_A10	74	6	20
EXT_A11/SD_A12	55	4	
EXT_A10/SD_A11	56	5	19
EXT_A9/SD_A9	58	7	32
EXT_A8/SD_A8	59	8	31
EXT_A7/SD_A7	61	18	30
EXT_A6/SD_A6	62	19	29
EXT_A5/SD_A5	64	20	28
EXT_A4/SD_A4	67	21	27
EXT_A3/SD_A3	68	22	24
EXT_A2/SD_A2	70	23	23
EXT_A1/SD_A1	71	24	22
EXT_A0/SD_A0	72	25	21

CUP11931Y

RDS SECTION(EUR Ver. ONLY)

RADIAL TYPE

+5VD
GND
MPX_OUT
RDS_CLK
RDS_DATA

Don't Use
+Option

TO VIDEO PCB

TO FRONT PCB

TO XM& IPOD PCB

AVR-145

245 Only

IC90
T5CC1

: PULL_UP
GPIO : Input/Out Port(without pull_up resistor)

Update: LOW

+OPTION_B

+OPTION_C

AVR132/230 & AVR144
USE : R712

Do not use

ONLY FOR AVR245/345

AVR145 ONLY

AVR245 / 345 ONLY

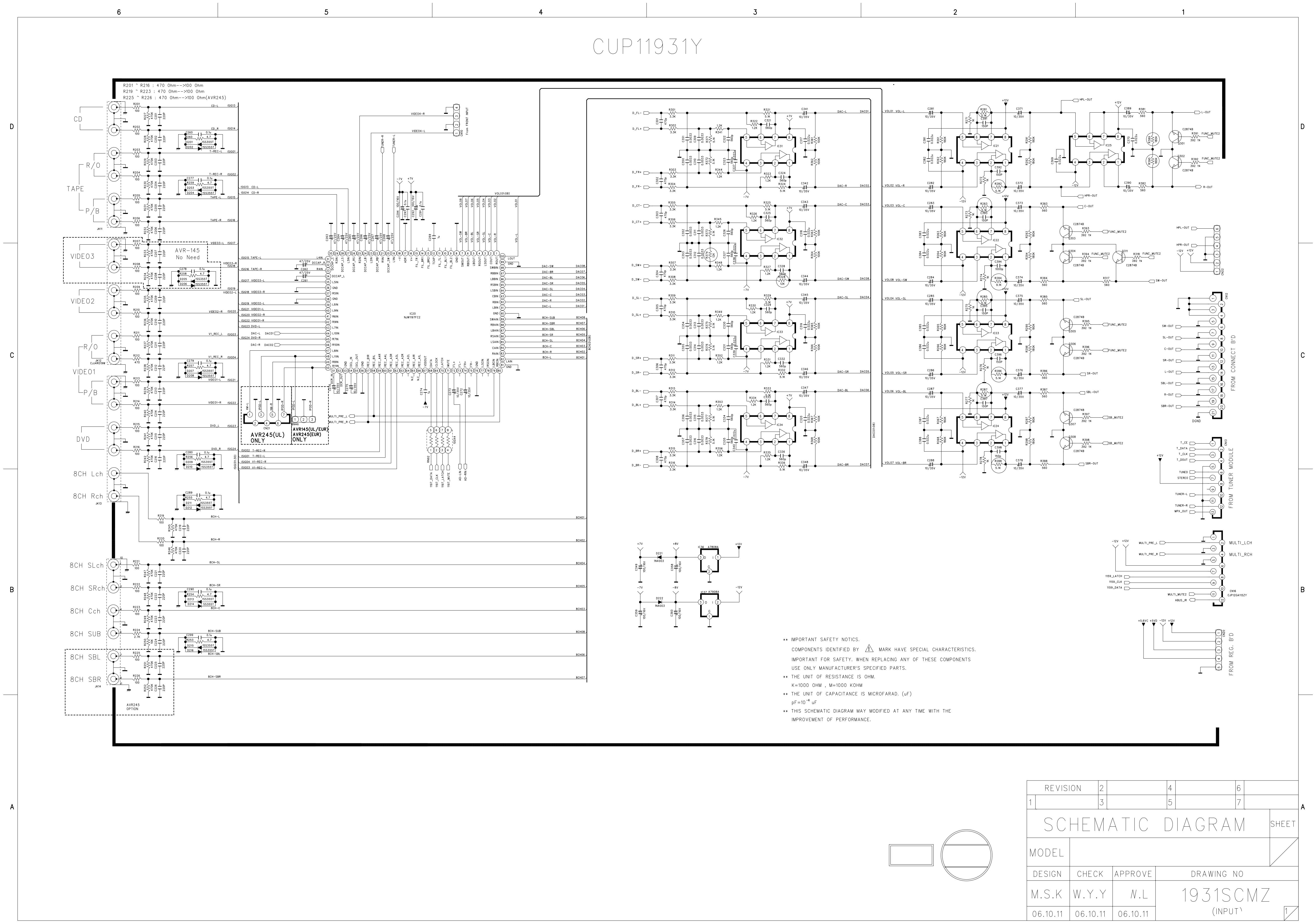
MODEL	OP_A(PIN48)	OP_B(PIN98)	OP_C(PIN52)
AVR145	HIGH(R792)	LOW(R791)	LOW(R712)
AVR245	LOW(R793)	LOW(R791)	LOW(R712)
AVR345	OPEN	LOW(R791)	NOT OPTION
AVR132	LOW(R793)	HIGH(R790)	LOW(R712)
AVR144	HIGH(R792)	HIGH(R790)	LOW(R712)
AVR145/230	HIGH(R792)	LOW(R791)	HIGH(R711)
AVR245/230	LOW(R793)	LOW(R791)	HIGH(R711)

REVISION	2	4	6
1	3	5	7

SCHEMATIC DIAGRAM — SHEET 4

MODEL

DESIGN	CHECK	APPROVE	DRAWING NO
M.S.K	W.Y.Y	H.W.L	1931SCMY)
06.10.11	06.10.11	06.10.11	3/3


CUP11931Y
R201 ~ R216 : 470 Ohm-->100 Ohm
R219 ~ R223 : 470 Ohm-->100 Ohm
R225 ~ R226 : 470 Ohm-->100 Ohm(AVR245)
CD
TAPE
R/O
P/B
VIDEO3
AVR-145
No Need
VIDEO2
VIDEO1
DVD
8CH Lch
8CH Rch
8CH SLch
8CH SRch
8CH Cch
8CH SUB
8CH SBL
8CH SBR
AVR245
OPTION
AVR245(UL)
ONLY
AVR145(UL/EUR)
AVR245(EUR)
ONLY
IC20
NJW1197FC2
From FRONT INPUT
FROM CONNECT B'D
FROM TUNER MODULE
MULTI_LCH
MULTI_RCH
FROM REG. B'D
** IMPORTANT SAFETY NOTICS.
COMPONENTS IDENTIFIED BY ⚠ MARK HAVE SPECIAL CHARACTERISTICS.
IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS
USE ONLY MANUFACTURER'S SPECIFIED PARTS.
** THE UNIT OF RESISTANCE IS OHM.
K=1000 OHM , M=1000 KOHM
** THE UNIT OF CAPACITANCE IS MICROFARAD. (uF)
pF=10^-6 uF
** THIS SCHEMATIC DIAGRAM MAY MODIFIED AT ANY TIME WITH THE
IMPROVEMENT OF PERFORMANCE.
REVISION
SCHEMATIC DIAGRAM
SHEET
MODEL
DESIGN
CHECK
APPROVE
DRAWING NO
M.S.K
W.Y.Y
N.L
1931SCMZ
(INPUT)
06.10.11
06.10.11
06.10.11

CUP11910Y

AVR145/245/345 OPTION-1

CUP11910-7 [DOWNLOAD JACK PCB]

FROM XM&IPOD ASS'Y

ST202EBW IC97

SW95 SW96

DIRECT(NONE CROSS) JK97

This jack use a direct cable for the RS-232C

* OPTION FOR ESD

JW86

SW1 DIMMER/PWR SW

FROM MAIN ASS'Y CN86

(PWR.(MOMS)SW PCB) CUP11910-4

CUP11910-5 [PHONE JACK PCB] [PHONE/VID3orVID4(DIGITAL)]

JK81 JK82 JK83 JW83

IC76 74HCU04AFN

TO INPUT ASS'Y BN18

AVR145/132/144 OPTION-1

AVR245/345 OPTION-2

RL45

IC86 NJM4556AL

H/P MUTE

HPL OUT HPR OUT

BN22 TO INPUT ASS'Y

CN90 BN92 TO VR JACK PCB

CN85 FROM FIP PCB

CUP11910-1 [FIP PCB]

BN84 TO VR JACK PCB

VOL_LED_CTRL VOL_EN2 VOL_EN1 KEY_1 KEY_2 KEY_3

BN88 CN88 [STAND BY PCB] CUP11910-3

IC73 IC74 IC75 74ACT04MTR

FROM INPUT ASS'Y(MCU) CN72

POWER_H MIC_IN KEY_1 KEY_2 KEY_3 VOL_EN1 VOL_EN2 VFD_CS VFD_CLK VFD_DATA VFD_RST HP_IN HP_MUTE2 REMOTE_IN

[KEY PCB] CUP11910-2

BN89

AVR245/345 OPTION-1

MIC_IN HP_IN HP_MUTE2

BN85 TO PHONE JACK PCB

FIP1

BN81 TO POWER ASS'Y

CUP11910-6 [VR JACK PCB] [VR/HEAD PHONE&(MIC)/VID3orVID4(ANLOG)]

AVR245/345 OPTION-3

IC41 NJU7301

IC87 NJM2068M

FROM PHONE JACK PCB

MIC SW MIC SIGNAL GND

AVR145/132/144 OPTION-3

AVR145/132/144 OPTION-4

JK85 JK86 JW84

FROM FIP PCB CN84

VOL_LED VOL_EN2 VOL_EN1

VR74 EC11E24

BN10 TO INPUT ASS'Y

BN41 TO VIDEO ASS'Y

CUP11910-8 [BLACKET JACK PCB FOR CARD CABLE]

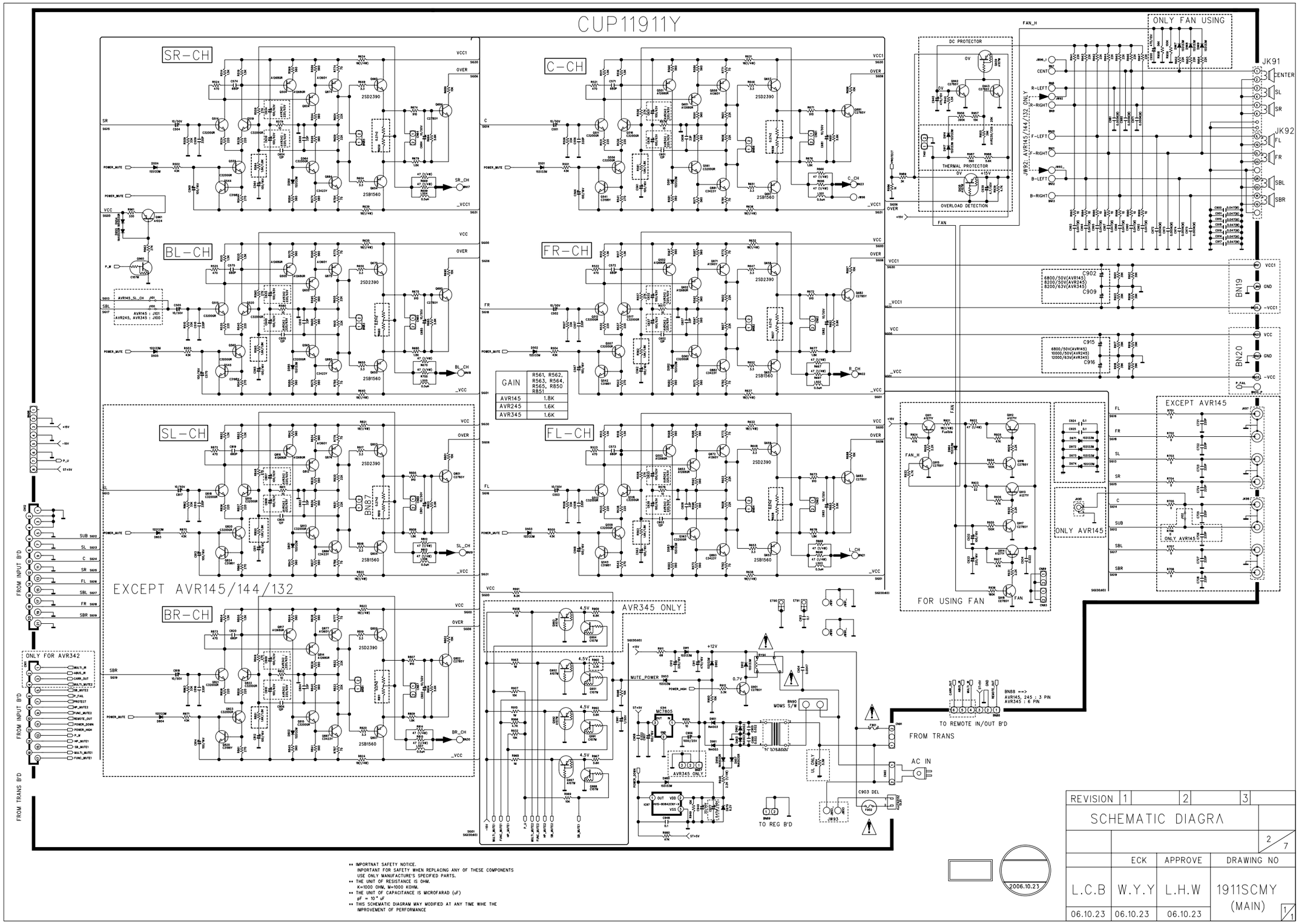
CUP11910-9 [BLACKET JACK PCB FOR PHONE JACK]

REVISION	2	4	6
1	3	5	7

SCHEMATIC DIAGRAM — SHEET 1/7

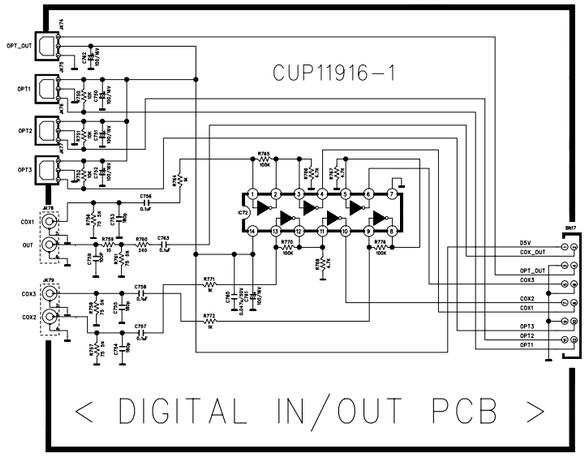
MODEL			
DESIGN	CHECK	APPROVE	DRAWING NO
06.10.23	06.10.23	06.10.23	CUP119 1/1

AVR 137/230

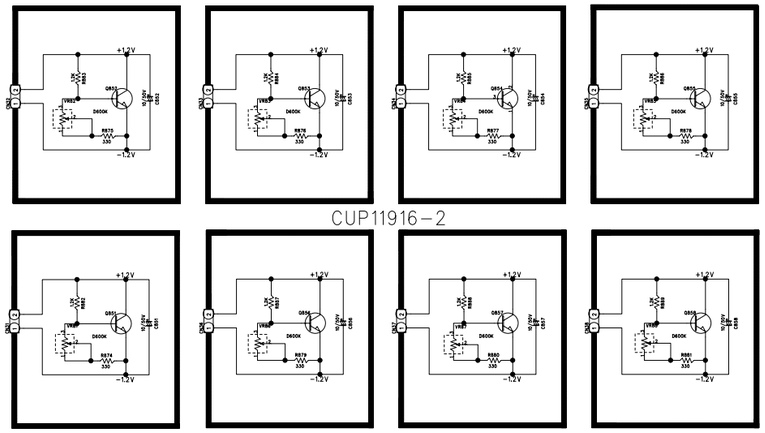

CUP11911Y
SR-CH
C-CH
BL-CH
FR-CH
SL-CH
FL-CH
BR-CH
EXCEPT AVR145/144/132
ONLY FAN USING
DC PROTECTOR
THERMAL PROTECTOR
OVERLOAD DETECTION
FAN
JK91
CENTER
SL
SR
JK92
FL
FR
SBL
SBR
JW92: AVR145/144/132 ONLY
L-CH
R-LEFT
R-RIGHT
F-LEFT
F-RIGHT
B-LEFT
B-RIGHT
BN19
BN20
C902
C909
C915
C916
6800/50V(AVR145)
8200/50V(AVR245)
8200/63V(AVR345)
10000/50V(AVR245)
12000/63V(AVR345)
EXCEPT AVR145
ONLY AVR145
FOR USING FAN
FROM INPUT B'D
FROM TRANS B'D
ONLY FOR AVR342
AVR345 ONLY
MOMS S/W
TO REMOTE IN/OUT B'D
FROM TRANS
AC IN
TO REG B'D
BN88 ==>
AVR145, 245 : 3 PIN
AVR345 : 6 PIN
GAIN
R561, R562, R563, R564, R565, R850 R851
AVR145 1.8K
AVR245 1.6K
AVR345 1.6K
** IMPORTNAT SAFETY NOTICE.
IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS USE ONLY MANUFACTURE'S SPECIFIED PARTS.
** THE UNIT OF RESISTANCE IS OHM.
K=1000 OHM, M=1000 KOHM.
** THE UNIT OF CAPACITANCE IS MICROFARAD (uF)
pF = 10^-6 uF
** THIS SCHEMATIC DIAGRAM MAY MODIFIED AT ANY TIME WIHE THE IMPROVEMENT OF PERFORMANCE
2006.10.23
REVISION 1 2 3
SCHEMATIC DIAGRA
2/7
ECK W.Y.Y
APPROVE L.H.W
DRAWING NO 1911SCMY (MAIN) 1/1
L.C.B 06.10.23
06.10.23
06.10.23

CUP11916Y

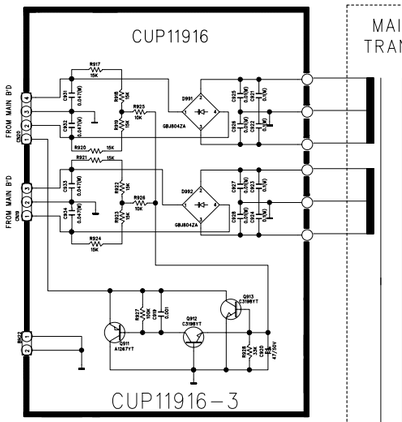
CUP11916-1



< BIAS T.R PCB >

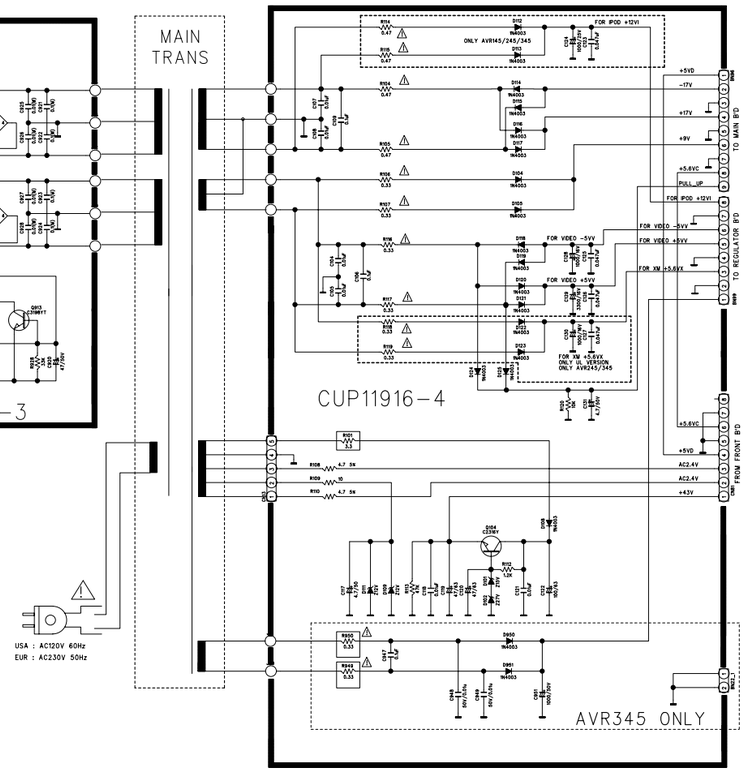


CUP11916



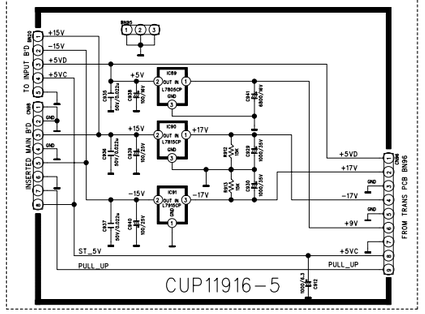
CUP11916-3

MAIN TRANS

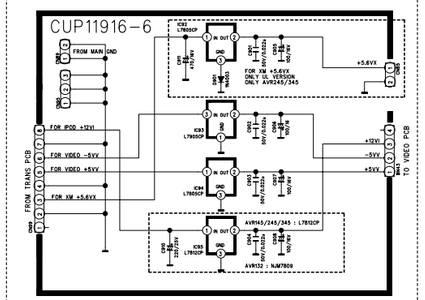


CUP11916-4

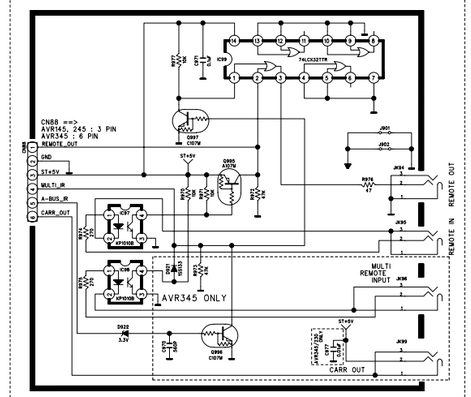
USA : AC120V 60Hz
EUR : AC230V 50Hz



CUP11916-5



CUP11916-6



< REMOTE IN/OUT PCB >

CUP11916-7

REVISION	2		4		6	
1		3		5		7

SCHEMATIC DIAGRAM

SHEET

MODEL

DESIGN	CHECK	APPROVE	DRAWING NO
L.C.B	Y.W.Y	H.W	1916S (POWER)
06.10.23	06.10.23	06.10.23	1/1

2006.10.23